

**ENVIRONMENTAL ASSESSMENT
LIVESTOCK GRAZING AUTHORIZATION**

EA Number - CA-650-2004-36

**Allotment Name(s): Cantil Common, Monolith Cantil, Boron,
Bissell, Antelope Valley, Warren, Spangler Hills, Hansen Common,
Lava Mountain, Rudnick Common, and Walker Pass Common
sheep allotments**

Ridgecrest Field Office, BLM

March 6, 2006

TABLE OF CONTENTS

1. CHAPTER 1	3
A. INTRODUCTION	3
B. NEED	3
C. PLAN CONFORMANCE	4
2. CHAPTER 2	8
A. CURRENT MANAGEMENT	8
B. PROPOSED ACTION	12
C. NO GRAZING ALTERNATIVE	17
3. CHAPTER 3 – ENVIRONMENTAL ANALYSIS	17
A. AIR QUALITY	17
B. AREA OF CRITICAL ENVIRONMENTAL CONCERN	20
C. BIOLOGICAL SOIL CRUSTS	23
D. CULTURAL RESOURCES	26
E. ENVIRONMENTAL JUSTICE	33
F. FARMLANDS, PRIME OR UNIQUE	34
G. FLOOD PLAINS	34
H. INVASIVE, NON-NATIVE SPECIES	34
I. NATIVE AMERICAN CONCERNS	37
J. RECREATION	39
K. SOCIAL & ECONOMIC VALUES	41
L. SOILS	42
M. SPECIAL STATUS PLANTS SPECIES	44
N. WASTE, HAZARDOUS OR SOLID	46
O. WATER QUALITY	46
P. WETLANDS/ RIPARIAN ZONES	48
Q. WILD AND SCENIC RIVERS	50
R. WILDERNESS	50
S. WILD HORSES AND BURROS	54
T. WILDLIFE	54
U. VEGETATION	62
4. CHAPTER 4 – PARTICIPATING STAFF	66
5. APPENDIX 1 – ALLOTMENT MAPS	68
6. APPENDIX 2 - PROPER USE FACTORS	70
7. APPENDIX 3 – RANGE IMPROVEMENTS	71
8. APPENDIX 4 – WILDLIFE TABLES	76
9. APPENDIX 5 – SHEEP GRAZING PERMIT TERMS & CONDITIONS	83
10. APPENDIX 6 – LIVESTOCK GRAZING CULTURAL AMENDMENT	85
11. APPENDIX 7 – EPHEMERAL SHEEP STUDY	91
10. REFERENCES	93

CHAPTER 1

A. INTRODUCTION

In 2000, 11 grazing permits/leases for sheep operations in the Ridgecrest Field Office area expired at the end of the 1999 grazing year (2/28/00). These 11 grazing leases were renewed under the authority of Public Law 106-113. The duration of the grazing leases renewal varied by allotment based on factors that included rangeland health condition. Grazing leases were for ten year terms, and contained the same terms and conditions as the expiring grazing lease. Public Law 106-113 required compliance with all applicable laws and regulations, which include the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA). Following the analysis of environmental impacts these grazing leases may be canceled, suspended or modified, in whole or in part, to meet the requirements of such applicable laws and regulations.

The Washington Office Instruction Memorandum 2003-071 requires that all grazing permits and leases that expired in 1999 and 2000 be “fully processed” by the end of Fiscal Year 2004 (9/30/04). The term “fully processed” permit/lease refers to the completion of an adequate environmental analysis and issuance of a proposed grazing decision in accordance with 43 CFR 4160, and appropriate consultation in accordance with the ESA.

The Bureau of Land Management (BLM) is proposing to issue a 10 year term permits on the following allotments: Antelope Valley, Bissell, Boron, Cantil Common, Hansen Common, Lava Mountain, Monolith Cantil, Rudnick Common, Spangler Hills, Walker Pass Common, and Warren, in the Ridgecrest Field Office area. All these allotments are within the jurisdiction of the California Desert District management area of the BLM. The purpose is to authorize ephemeral livestock (sheep) grazing where it already exists or has existed on the allotments. A description of the allotments may be found in Chapter 2, Section B: Livestock Management.

B. NEED FOR THE PROPOSED ACTION

The proposed action is needed to authorize grazing in accordance with 43 CFR 4100 and consistent with the provisions of the *Taylor Grazing Act*, *Public Rangelands Improvement Act*, and *Federal Land Policy and Management Act*. Action may be required to maintain or improve resource conditions including rangeland health. The existing permits/leases are valid for 10 years which end on 2/28/2010 and are subject to the terms and conditions therein. The terms and conditions of the permits/leases may be modified by the findings of this environmental assessment.

There were no Rangeland Health Assessments performed on most of these allotments. The Rudnick Common Allotment and the Walker Pass Common Allotment have Assessments and determinations completed. Currently the remaining assessments are scheduled for completion in 2006. Both the assessment process and the standards are in a state of change. The assessments will be conducted following the procedures in the newly released “Interpreting Indicators of Rangeland Health (Tech Reference 1734-6), version 4 (2005)”. Currently the fall back national standards are in place.

C. PLAN CONFORMANCE & RELATIONSHIP TO STATUTES, AND REGULATIONS

The proposed action is subject to the California Desert Conservation Area Plan (CDCA Plan) 1980 as Amended (August 1999). The proposed action has been determined to be in conformance with this plan as required by regulation (43 CFR §1610.5-3(a)). The proposed action would occur in areas identified for livestock grazing as indicated in the Livestock Grazing Element in the CDCA Plan 1980 (1999), pages 56 to 68. The proposed action is consistent with the land use decisions, and goals and objectives listed in the CDCA Plan.

Endangered Species

Several of the allotments are within the range of federally listed threatened or endangered species. Pursuant to Section 7 of the Endangered Species Act, formal consultation with the Fish and Wildlife Service (FWS) is required on all allotments for which livestock grazing may affect listed species. The stipulations of any grazing permit may need to be modified to conform to the terms and conditions specified in a FWS biological opinion to minimize take of listed animal species. In addition, the terms and conditions of any grazing permit may also need to be modified to conform to decisions made to achieve recovery plan objectives as determined through subsequent land use plan amendments or revisions. For instance, Plan Amendment 19 to the California Desert Conservation Area Plan was adopted in 1990 and formalizes the classification of land in which the Desert Tortoise is found. The Western Mojave Habitat Conservation Plan is an amendment to the CDCA plan that is currently being prepared.

Several of the allotments also provide habitat for State listed fish, wildlife, and plant species. According to the MOU between BLM and CDFG we agree: "to notify the Department of all projects involving impacts to, or manipulation of, State-listed rare (threatened) and endangered fish, wildlife and plants and to obtain State recommendations of the project-specific management of such populations."

Special Status Plant Species:

It is BLM's policy to carry out management, consistent with the principals of multiple use, for the conservation of Special Status Plant Species and their habitats and will ensure that actions authorized, funded, or carried out do not contribute to the need to federally list any of the species as threatened or endangered.

Cultural Resources

California BLM has explicit responsibility to manage cultural resources on public lands under the National Historic Preservation Act (NHPA; P.L. 89-665); Federal Land Policy and Management Act (FLPMA; P.L. 94-579); Archaeological Resources Protection Act (ARPA; P.L. 96-95); Native American Graves Protection and Repatriation Act (NAGPRA; P.L. 101-601); American Indian Religious Freedom Act (AIRFA; P.L. 95-431); and other law and implementing regulation. General compliance with these requirements is outlined in the Programmatic Agreement Among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act (National PA) and the Protocol Agreement between California BLM and the California State Historic Preservation Officer Regarding the Manner in which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act (Protocol Agreement).

All grazing permits will be subject to compliance with Section 106 of the National Historic Preservation Act following procedures defined in an amendment to the Protocol Agreement (Livestock Grazing Amendment or Amendment). Background site record and literature review will be conducted. Inventory will focus on the intersection between areas that are known or suspected to contain significant cultural resources and areas in which animals congregate and therefore have the greatest potential to affect cultural resources. An inventory design following the terms of the Protocol Range Amendment will be written for each allotment. Inventory will be carried out following that design. Results of inventory and actions taken to avoid adverse effects to cultural resources will be reported annually to the BLM California State Office and the State of California Office of Historic Preservation. Compliance with Section 106 requirements must be completed within 10 years. Federally recognized and State recognized Native American tribal groups and individuals are being consulted on issues of concern to them, such as the presence of sacred, traditional use, or other culturally important areas or features. The results of this analysis will be used to modify grazing permits. Stipulations on each grazing permit will be modified to reflect compliance with the Livestock Grazing Amendment. All cultural resources will be subject to review and evaluation to identify effects resulting from grazing and related activities. All cultural resources will be afforded protection or mitigation consistent with law, policy, and the Protocol Livestock Grazing Amendment.

Wilderness

Wilderness areas occur in three of the 11 allotments under consideration. The El Paso Mtn. Wilderness is in Cantil Allotment and the Golden Valley Wilderness is in the Spangler Hills and Lava Mountain allotments. Grazing activities currently occur in wilderness. For the purpose of this analysis, the proposed action contains no impacts that are expected to occur above those impacts already occurring under current grazing management.

The proposed action is consistent with the California Desert Protection Act of 1994: “CDPA (P. L. 104-433, Section 103.(c)): “Livestock.—Within the wilderness areas designated under Section 102, the grazing of livestock, where established prior to the date of enactment of this Act, shall be permitted to continue subject to such reasonable regulations, policies, and practices as the Secretary deems necessary, as long as such regulations, policies, and practices fully conform with and implement the intent of Congress regarding grazing in such areas as such intent is expressed in the Wilderness Act and section 101(f) of Public Law 101-628.

In general, the wilderness act prohibits roads, motorized equipment, mechanical transport, landing of aircraft, and placement of new structures and installations. The wilderness areas are managed primarily to preserve natural features. For allotments containing wilderness areas, allotments are required to be managed under the provisions of the 1964 Wilderness Act and enabling legislation for the wilderness area.

Congress provided additional guidance for managing livestock within wilderness areas through the Congressional grazing guidelines found in the 1980 Colorado wilderness legislation. Regulations to manage livestock in wilderness is found in 43 CFR 6300. For allotments within Wilderness Study Areas, they shall be managed consistent with the direction found in the Interim Policy Management Handbook 8550.

Water Quality

All allotments fall within the guidance of the Lahontan Basin Plan and are subject to federal and state clean water acts. Executive Order #12088 directs federal agencies to comply with state administrative procedures. Recently, Standards and Guidelines reiterated the intent of the Federal Clean Water Act (CWA) and States' water quality plans. An MOU (BLM Manual Supplement 6521.11) with the California Department of Fish and Game describes how BLM and DF&G will coordinate where activities could affect aquatic or riparian habitat. The Unified Federal Policy to insure a Watershed Approach in Federal Land and Resource Management (UFP) requires 1) all plans and activity management be conducted on a watershed basis, 2) that all land owners/managers within a watershed be solicited for participation in the planning and management of the watershed, 3) that citizens and officials are better informed of planning and management, 4) that best science is used. The EA should analyze grazing within the Watershed Concept described in the UFP. Where there is a threat to water quality or where water quality does not meet state standards coordination must occur with the regional water quality control board(s) and where aquatic or riparian habitat may be impacted CDF&G coordination must occur. All allotments that contain any water bodies (streams, lakes, springs, etc.) must have adopted Best Management Practices (BMP) for all activities associated with livestock management that could affect water quality.

The federal Clean Water Act (CWA) delegates to the states the authority to regulate certain activities that may affect water quality. The California State Porter-Cologne Act (CA Water Code ' 13140-13143) establishes the State Water Quality Control Board and nine Regional Water Quality Control Boards (RWQCB). It directed the preparation of Basin Plans and provided guidance on factors to include in the plans. It also implemented the Federal Clean Water Act. The project is within the Lahontan Region and under the jurisdiction of the Lahontan RWQCB. The Lahontan RWQCB as prepared a Basin Plan (*Water Quality Control Plan for the Lahontan Region*) which includes beneficial uses, water quality standards and waste discharge requirements.

Air Quality

The proposed action falls within the jurisdiction of three different air quality management districts. The Mojave Desert Air Quality Management District (MDAQMD) is located in San Bernardino County, the Kern County Air Pollution Control District (KCAPCD) is located in eastern Kern County and the Great Basin Unified Air Pollution Control District (GBUAPCD) is located in Inyo County. Each of these districts has state air quality jurisdiction over their portion of the project area. Each of these districts has rules which apply to fugitive dust emissions.

Federal Conformity: Projects within federal air quality nonattainment areas have an additional burden in that federal agencies must make a determination that its actions conform to the State Implementation Plans (SIP) before the action is taken (Section 176 (c) of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 *et seq.*) and regulations under 40 CFR part 93 subpart W). These authorities address the conformity of general federal actions to SIPs. These authorities state, "No department, agency or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan". Regulations at 40 CFR Part 93.153 Applicability includes a number of exceptions to the requirements of the conformity rules including the following:

“(c) The requirements of this subpart shall not apply to the following Federal actions:

(iii) Continuing and recurring activities such as permit renewals where activities will be similar in scope and operation to activities currently being conducted.”

Regulations: Management of habitat for the tortoise and over 100 other sensitive species on public lands is being addressed, For livestock grazing purposes, this proposal is subject to BLM regulations at 43 CFR 4100 (grazing regulations).

Plans: West Mojave Plan (Proposed Habitat Conservation Plan/CDCA Plan amendment): BLM, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), county and city governments, various interest groups, the U.S. military, and a number of public lands stakeholders currently are developing this plan. Upon completion, it is intended to amend the CDCA Plan. The West Mojave Plan is a local bio-regional planning effort addressing State and federally-listed species, specifically the desert tortoise. BLM issued the West Mojave Plan Draft Environmental Impact Statement (WMP-DEIS) in May 2003.

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

A. CURRENT MANAGEMENT

The current management alternative consists of authorizing ephemeral sheep grazing on 11 allotments, under sixteen grazing permits and leases. Each renewed permit and lease would be for a term of ten years. These renewed grazing permits would include the terms and conditions stated in the Biological Opinion for Ephemeral Sheep Grazing in the California Desert District (6840 CA-932.5) (1-8-94-F-16), see Appendix 4. In addition, stipulations directed by existing decision or through an existing agreement would also be included in these grazing permits. Table A. outlines the number of bands of sheep and numbers of AUMs as they have occurred over the past 13 years.

1. Livestock Numbers and Season of Use

Sheep allotments in the Ridgecrest Resource Area do not have specific "livestock numbers" attached to them. Permits to graze are issued by the number of "bands" or flocks of sheep an operator wishes to graze. Band size varies from 500 to 1000 ewe-lamb pairs and averages 800 ewe-lamb pairs. An AUM is an "animal unit month" and is calculated on the amount of forage a sheep consumes in a month. Cattle set the standard at 1000 pounds of forage per month and sheep are calculated to consume approximately 200 pounds of forage per month. Therefore, there are five sheep per AUM. The season of use in the Ridgecrest Resource Area is roughly from 3/20 to 5/31 in years when there is enough ephemeral forage production to sustain grazing. The following table gives an indication of the intensity of use on each allotment in the Ridgecrest Field Office Area.

Table 1: Range & Average of Number of Sheep Bands & AUMs Grazed 1991-2003

Ridgecrest Allotments	No. of Years Used, 1991-	Range of No. of bands/ Year of Use	Average No. of Bands/Year of Use	Range of No. of AUMs 1991-2003	Average No. of AUMs/Year of Use
Antelope Valley	3	1-2	2.0	60-164	111
Bissell	8	1-6	3.0	13-683	318
Boron	5	1-3	2.0	58-208	138
Cantil Common	7	14-23	18.0	3055-4447	3680
Lava Mtn	6	1-4	2.0	32-1009	408
Monolith Cantil	6	1-4	2.0	102-499	260
Spangler Hills	8	2-8	3.0	165-1692	775
Warren	9	1-2	2.0	40-99	59
Hansen	7	1-4	3.0	144-504	504
Rudnick	1	1	1.0	654	654
Walker Pass	5	4-6	5.0	269-1668	692

2. Livestock Management

Sheep grazing in the Ridgecrest Field Office area potentially occurs on 11 allotments (described below). The sheep customarily graze in a meandering pattern through the allotment and are always in a loosely aggregated flock of about 800 ewe-lamb pairs. At times during the day the band (flock) will be gathered in a tighter aggregation for watering and bedding at night. All sheep grazing is subject to the U. S. Fish and Wildlife Service Biological Opinion 6840 CA-932.5 (1-8-94-F-16) that stipulates the terms and conditions of ephemeral grazing (see Appendix 4).

Ridgecrest Sheep Allotments

(Map of existing Sheep Allotments, see Appendix 1)

Antelope Valley Allotment is an ephemeral allotment consisting of 7,785 acres comprised of 627 acres of private land and 7,158 acres of BLM lands. This allotment has 1,048 acres of non-critical desert tortoise habitat. The allotment is located in southeastern Kern County, California, west of Mojave and U.S. Highway 14. In years of adequate ephemeral forage production, sheep grazing is authorized. Ephemeral forage is found on large flats. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Bissell Allotment is an ephemeral allotment consisting of 48,850 acres comprised of 43,254 acres of private land and 5,596 acres of BLM lands. This allotment has 5,596 acres of non-critical desert tortoise habitat. The allotment is located in southeastern Kern County, California, east of Mojave, south of California City, and north of state highway 58. In years of adequate ephemeral forage production, sheep grazing is authorized. Ephemeral forage is found on large flats. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Boron Allotment is an ephemeral allotment consisting of 82,855 acres comprised of 72,003 acres of private land and 10,852 acres of BLM lands. This allotment has 10,868 acres of non-critical desert tortoise habitat. The allotment is located in southeastern Kern County and northwestern San Bernadino County, California, north of state highway 58 and west of U.S. Highway 395. In years of adequate ephemeral forage production, sheep grazing is authorized. Ephemeral forage is found on large flats. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Cantil Common Allotment is an ephemeral allotment consisting of 555,674 acres comprised of 236,611 acres of private land and 319,063 acres of BLM lands. This allotment has 34,744 acres of wilderness in the El Paso Mountain and Golden Valley wildernesses. This allotment has 240,913 acres of non-critical desert tortoise habitat, and 78,035 acres of desert tortoise critical habitat. The allotment is located in northeastern and southeastern Kern County and northwestern San Bernadino County, California. It is bounded by U.S. Highway 14 on the west, China Lake Naval Air Weapons Station on the north, the Bissell and Boron allotments on the south and sections of U.S. Highway 395 and the Red Mountain-Trona Road on the east. A large section stretching through the middle of allotment is no longer authorized for grazing because it is

critical desert tortoise habitat. This area is bounded by Garlock Road on the north and extends south of the Rand Mountains. In years of adequate ephemeral forage production, sheep grazing is authorized in non-critical tortoise habitat. Ephemeral forage is found on large flats and also on the broad hillsides and valleys of the El Paso Mountains. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment. The ranchers have split the allotment into "use areas" and there are generally 4-7 ranchers using this common allotment.

The Hansen Common Allotment is a perennial/ephemeral cattle/sheep grazing allotment. There are 71,976 acres comprised of 37,092 acres of private land and 34,884 acres of BLM land. In areas of the allotment where ephemeral sheep grazing is authorized, ephemeral cattle grazing is not authorized. The allotment is located in northeastern Kern County, California. It is roughly bounded on the southeast by U.S. Highway 14, on the south by a short stretch of state highway 58, and on the north by Rudnick Common Allotment. Forage for sheep is found on the alluvial plains on the south and east side of the allotment and on the hillsides from which the alluvial plains descend. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations and can be moved as sheep are herded through the allotment.

The Lava Mountain Allotment is an ephemeral allotment consisting of 20,873 acres of BLM lands. This allotment has 18,757 acres of non-critical and 2,146 acres of critical desert tortoise habitat. There are 20,412 acres of the Golden Valley Wilderness in this allotment. The allotment is located in northwestern San Bernadino County, California east of the Red Mountain-Trona Road, west of the south range of China Lake Naval Air Weapons Station and north of Cuddeback Dry Lake. In years of adequate ephemeral forage production, sheep grazing is authorized in both non-critical and a small portion of critical habitat. Ephemeral forage is found on large flats and hillsides of the mountains. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Monolith Cantil Allotment is an ephemeral allotment consisting of 47,566 acres comprised of 9,789 acres of private land and 37,777 acres of BLM lands. This allotment has 7,939 of non-critical desert tortoise habitat and 29,846 acres of critical desert tortoise habitat. The critical habitat is mostly to the east of U.S. Route 395 in the Desert Wildlife Management Area (DWMA) and is no longer grazed. The allotment is located in northwestern San Bernadino County, California. It is north of the Boron allotment, east of the Cantil Common allotment and west of U.S. Highway 395. In years of adequate ephemeral forage production, sheep grazing is authorized in non-critical habitat. Ephemeral forage is found on large flats. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Rudnick Common Allotment is a perennial/ephemeral cattle/sheep grazing allotment. There are 241,787 acres comprised of 79,683 acres of non-BLM land and 162,104 acres of BLM land. This allotment has 34,744 acres of wilderness in the Bright Star and Kiavah wilderness areas. The allotment is located in northeastern Kern County, California. It is bounded on the south by Hansen Common Allotment, on the southeast by U.S. Highway 14 and Red Rock Canyon State Park, and, on the north and west by sections of the Sequoia National Forest. The eastern pastures of the allotment historically have been used for ephemeral sheep grazing, but there has been no

ephemeral sheep grazing since 1993 on the allotment. At the present time there is no rancher designated with a preference to graze sheep on the allotment. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill).

The Spangler Hills Allotment is an ephemeral allotment consisting of 68,875 acres comprised of 3,724 of private land and 65,151 acres of BLM lands. This allotment has 54,143 acres of non-critical desert tortoise habitat. There are 4,373 acres of the Golden Valley Wilderness in this allotment. The allotment is located in northwestern San Bernadino County, California. It is east of Red Mountain-Trona Road, south of the north range of China Lake Naval Air Weapons Station, west of the south range of China Lake Naval Air Weapons Station, and north of the Lava Mountain allotment. In years of adequate ephemeral forage production, sheep grazing is authorized. Ephemeral forage is found on large flats and the hillsides of the mountains. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill). Water is hauled to temporary locations along existing roads and can be moved as sheep are herded through the allotment.

The Walker Pass Common Allotment is a perennial/ephemeral cattle/sheep grazing allotment. There are 96,947 acres comprised of 7,754 acres of non-BLM land and 89,193 acres of BLM land. There are three wilderness areas within the boundaries of the allotment; Kiavah, Owens Peak, and Sacatar Trail. They comprise 65,100 acres. The allotment is located in northeastern Kern County and southwestern Inyo County, California. It stretches from south to north from just south of state highway 178 to Little Lake and is bounded by the Sierra Nevada crest on the west and U.S. Highway 395. Periodically, in the past, the flats at the base of the mountains have been used for ephemeral sheep grazing. There is a north-south stock driveway that historically ran through the area. Sheep were often herded to northern pastures along this stock driveway. Though several ranchers still retain authorization to use this stock driveway, it was last used in 1998. The primary ephemeral forage on the allotment is *Erodium cicutarium* (Filaree or Heron's Bill).

The Warren Allotment is a perennial allotment consisting of 556 acres of BLM land and comprised of non-critical desert tortoise habitat. Though it is a perennial allotment it is managed as an ephemeral allotment. The allotment is located in southeastern Kern County, California, northwest of Mojave on section 34 of township 11 north, range 13 west of the San Bernadino Base Meridian. In years of adequate perennial forage production, sheep grazing is authorized. Forage is found on rolling flats. Water is hauled to temporary locations and can be moved as sheep are herded through the allotment.

3. Range Improvements

Cantil Common Allotment is the only sheep allotment with range improvements. It has 15 springs, wells, and storage structures. Sheep Springs is the only spring and storage structure that is currently use by sheep operators and it is functioning very well. The other springs and wells are largely not functioning but it is recommended that the wells be left as they are because of their value as future monitoring wells. (See Appendix 2).

4. Measures to Maintain or Achieve Standards (Terms and Conditions of Permit)

None

5. Monitoring

The rangeland monitoring of the sheep allotments in the Ridgecrest Field Office area would be conducted as it is currently. In years when there is enough winter moisture to consider spring grazing in the desert ephemeral forage production studies are done. In some years composition studies are also conducted.

The ephemeral forage production studies are performed using the Comparative Yield Method (Interagency Technical Reference 1734-4, p116-122). The recently approved West Mojave Habitat Conservation Plan amendment stipulates that there must be a minimum of 230 pounds per acre (air-dry weight) of ephemeral forage in order for sheep to be turned out for grazing.

B. PROPOSED ACTION:

This alternative was developed after a review of resource issues and conditions found on 11 sheep grazing allotments found in the Ridgecrest Field Office areas. Monitoring requirements, mitigation measures, and permit terms and conditions developed in the resolution of issues will be incorporated into this alternative to minimize potential impacts to resources while continuing to provide forage for livestock grazing. These measures are in addition to all terms and conditions described in Current Management.

1. Livestock Numbers and Season of Use

Livestock numbers would remain the same as reported under Current Management unless it was determined that there were not sufficient watering and bedding sites free of archaeological artifacts within the Last Chance Canyon National Register District. The season of use would not be affected. Allotments used for sheep grazing outside of Cantil Common would not be affected.

2. Livestock Management

Grazing will be subject to the same terms and condition as outlined in Current Management. In addition; the BLM, under the authority of CFR 4180.1 which includes by reference subparts 4110, 4120, 4130, and, 4160, will:

- A. in all areas occurring in tortoise habitat, authorize ephemeral grazing only when ephemeral production exceeds 230 pounds per acre. The permittee would be required to remove sheep from the area or from the entire allotment if ephemeral production falls below 230 pounds per acre; and
- B. limit sheep band size to 1,600 individual animals, whether adult, lamb or a mix; and
- C. suspend grazing during the ephemeral grazing season when ephemeral plants are no longer the primary forage being utilized by sheep; and
- D. suspend grazing during the ephemeral grazing season when the species specific, maximum utilization levels set forth in table below, are met; and.

COMMON NAME	SCIENTIFIC NAME	MAXIMUM UTILIZATION
Winter Fat	Krascheninnikova lanata	30%
Spiny Hopsage	Grayia spinosa	25%
Four-winged sagebrush	Atriplex canescens	25%
Shadescale	Atriplex confertifolia	25%
Allscale	Atriplex polycarpa	25%

E. require all sheep carcasses would be removed or disposed of in an appropriate manner.

2a. Livestock Management with respect to Cultural Resources

Grazing in all sheep allotments would be subject to the Livestock Grazing Amendment (Appendix 5) as a protocol for dealing with impacts to cultural resources.

To reduce or eliminate impacts to cultural resources within the allotments, terms and conditions of the Livestock Grazing Amendment will be followed. These terms will also be incorporated into the Terms and Conditions of the Permit (see Standard Protective Measures in Appendix 5). Actions under the Amendment will include planning and scheduling, inventory and other pertinent identification efforts, consultation with tribal and other interested parties, evaluation of resources as required under the Amendment, application of Standard Protective Measures from the Amendment, monitoring, and reporting of results to the BLM California State Office and the State Historic Preservation Officer. A schedule for carrying out these actions will be established as part of the 2006 annual report on implementation of the Addendum. As identification efforts are carried out and Standard Protective Measures from the Addendum are applied, impacts to cultural resources will be eliminated or reduced to a level that is in compliance with the Addendum. If Standard Protective Measures cannot achieve compliance with the Addendum, consultation with the State Historic Preservation Officer will be initiated.

In addition to the measures above, within the Last Chance Canyon National Register District (LCCNRD) designated locations for all sheep management facilities (loading and unloading areas, watering and bedding stops, herd camps, etc.) will be identified. These locations will be established only where cultural resource identification efforts (inventory, records checks, Native American consultation) show that no cultural resources will be affected. A program of data collection and monitoring will be carried out to identify impacts to cultural resources within the Last Chance Canyon National Register District, an area of approximately 108 square miles in the El Paso Mountains. Impacts to archaeological sites within the National Register district from sheep grazing have been observed but the severity and extent of impacts is unclear. The program will consist of three elements, which may be carried out concurrently or sequentially. These elements (see Appendix 6) are assemblage of existing cultural resources information from a variety of sources into a single useable data base, a monitoring program to study the effects of sheep grazing on cultural resources in varying situations, and a systematic sample inventory to identify where and under what conditions sheep grazing may be affecting cultural resources. These studies will be carried out within 3 years of the date upon which this EA is signed. Results of the studies will be used to modify sheep grazing as necessary to reduce or halt impacts. Native Americans will be asked to assist or advise in these steps so that sacred, traditional use, and other values may be considered during the process.

2b. Livestock Management with respect to Wildlife

Carcasses of sheep that die while being grazed on public land will be disposed of appropriately to reduce raven scavenging.

3. Range Improvements

The same as for Current Management

4. Measures to Achieve or Maintain Standards (Terms and Conditions of Permit)

None

5. Monitoring

Monitoring of sheep allotments would continue as described in the Current Management Alternative.

6. Regional Standards and Guidelines

With the recent approval of the West Mojave Habitat Conservation Plan Amendment the following Standards and Guidelines are incorporated into the grazing permit & management practices.

Standards:

Soil

Soils exhibit infiltration and permeability rates that are appropriate to soil type, climate geology, landform, and past uses. Adequate infiltration and permeability of soils allow accumulation of soil moisture necessary for optimal plant growth and vigor , and provide a stable watershed as indicated by:

- Canopy and ground cover are appropriate for the site;
- There is diversity of plant species with a variety of root depths;
- Litter and soil organic matter are present at suitable sites;
- Maintain the presence of micro biotic soil crusts that are in place;
- Evidence of wind or water erosion does not exceed natural rates for the site;
- Hydrologic and nutrient functions maintained by permeability of soil and water; infiltration are appropriate for precipitation.

Native Species

Healthy, productive and diverse habitats for native species, including special status species (Federal T&E, federal proposed, federal candidates, BLM sensitive, or California State T&E, and CDD UPAs) are maintained in places of natural occurrence as indicated by:

- Photosynthetic and ecological processes continue at levels suitable for the site, season, and precipitation regimes;

- Plant vigor, nutrient cycle, and energy flow are maintaining desirable plants and ensuring reproduction and recruitment;
- Plant communities are producing litter within acceptable limits;
- Age class distribution of plants and animals are sufficient to overcome mortality fluctuations;
- Distribution and cover of plant species and their habitats allow for reproduction and recovery from localized catastrophic events;
- Alien and noxious plants and wildlife do not exceed acceptable levels;
- Appropriate natural disturbances are evident;
- Populations and their habitats are sufficiently distributed to prevent the need for listing special status species.

Riparian/Wetland and Stream Function

Wetland systems associated with subsurface, running, and standing water, function properly and have the ability to recover from major disturbances. Hydrologic conditions are maintained as indicated by:

- Vegetative cover will adequately protect banks, and dissipate energy during peak water flows;
- Dominant vegetation is an appropriate mixture of vigorous riparian species;
- Recruitment of preferred species is adequate to sustain the plant community;
- Stable soils store and release water slowly;
- Plants species present indicate soil moisture characteristics are being maintained;
- There is minimal cover of invader/shallow-rooted species, and they are not displacing deep-rooted native species;
- Maintain shading of stream courses and water sources for riparian dependent species;
- Stream is in balance with water and sediment being supplied by the watershed;
- Stream channel size and meander is appropriate for soils, geology, and landscape;
- Adequate organic matter (litter and standing dead plant material) is present to protect the site and to replenish soil nutrients through decomposition.

Water Quality

Surface and groundwater complies with objectives of the Clean Water Act and other applicable water quality requirements, including meeting the California State Standards, as indicated by:

- The following do not exceed the applicable requirements: chemical constituents, water temperature, nutrient loads, fecal coliform, turbidity, suspended sediment, and dissolved oxygen;
- Achievement of the Standards for riparian, wetlands, and water bodies;
- Aquatic organisms and plants (e.g., macro invertebrates, fish and algae) indicate support of beneficial uses;
- Monitoring results or other data that show water quality is meeting the Standard.

Guidelines for Grazing Management:

Manage grazing activities with the following regional guidelines.

- Facilities are to be located away from riparian-wetland areas wherever they conflict with achieving or maintaining riparian-wetland functions.
- The development of springs and seeps or other projects affecting water and associated resources will be designed to protect the ecological functions and processes of those sites.
- Grazing activities at an existing range improvement that conflict with achieving proper functioning conditions (PFC) and resource objectives for wetland systems (lentic, lotic, springs, adits, and seeps) will be modified so PFC and resource objectives can be met, and incompatible projects will be modified to bring them into compliance. The BLM will consult, cooperate, and coordinate with affected interests and livestock producer(s) prior to authorizing modification of existing projects and initiation of new projects. New range improvement facilities are to be located away from wetland systems if they conflict with achieving or maintaining PFC and resource objectives.
- Supplements will be located a sufficient distance away from wetland systems so they do not conflict with maintaining riparian wetland functions.
- Management practices will maintain or promote perennial stream channel morphology (e.g., gradient, width/depth ratio, channel roughness, and sinuosity) and functions that are appropriate to climate and landform.
- Grazing management practices are to meet State and Feral water quality standards. Where impoundments (stock ponds) and troughs that have a sustained discharge yield of less than 200 gallons per day to surface or groundwater are exempted from meeting State drinking water standards per SWRCB Resolution Number 88-63.
- In the California Desert Conservation Area all wildfires in grazing allotments will be suppressed. However, to restore degraded habitats infested with invasive weeds (e.g., tamarisk) prescribed burning may be utilized as a tool for restoration on a case-by-case basis. Prescribed burns may be used as a management tool for chaparral plant communities in the South Coast Region, where fire is a natural part of the regime.
- In years when weather results in extraordinary conditions seed germination, seedling establishment and native plant species growth shall be allowed by modifying grazing use.
- Grazing on designated ephemeral (annual and perennial) rangeland is allowed to occur only if reliable estimates of production have been made, an identified level of annual growth or residue to remain on site at the end of the grazing season has been established, and adverse effects on perennial species are avoided.
- During prolonged drought, range stocking will be reduced to achieve resource objectives and/or prescribed perennial forage utilization. Livestock utilization of key perennial species on year-long allotments will be checked about March 1 when the Palmer Severity Drought Index/Standardized Precipitation Index indicates dry conditions are expected to continue.
- Through the assessment process or monitoring efforts, the extent of invasive and/or exotic plants and animals will be recorded and evaluated for future control measures. Methods and prescription will be implemented, and an evaluation will be completed to ascertain future control measures.
- Restore, maintain or enhance habitats to assist in the recovery of federally listed threatened and endangered species. Restore, maintain or enhance habitats of special status species including Federal proposed, Federal candidates, BLM sensitive, or California State T&E to promote their conservation.

- Grazing activities will support biological diversity across the landscape, and native species and micro biotic crusts are to be maintained.

Experimental and research efforts will be encouraged to provide answers to grazing management and related resource concerns through cooperative and collaborative efforts with outside agencies, groups, and entities.

C. NO GRAZING ALTERNATIVE

This alternative would cancel the permits on all the sheep allotments. As a result, grazing would not continue on any of the aforementioned allotments. This is to be a permanent cancellation. The BLM would initiate a process in accordance with the 4100 regulations to permanently eliminate grazing on the allotments.

CHAPTER 3: ENVIRONMENTAL ANALYSIS

A. AIR QUALITY

a. Affected Environment

Air quality throughout the project area is generally good. There are, however, times that portions of the area have not meet air quality standards due to locally generated and/or transported in pollutants. Currently portions of the project area are classified as nonattainment areas for ozone and PM10 under state standards and nonattainment for ozone and nonattainment/maintenance for PM10 under national ambient air quality standards. The USEPA has designated the East Kern County Ozone planning area (attainment for one-hour standard and nonattainment for eight hour standard) and the Indian Wells Valley PM10 Planning Area (maintenance), Trona (maintenance), Coso Junction (Maintenance) and San Bernardino County (nonattainment).

Ozone pollutants occur in the area primarily from transport in from the South Coast Air Basin and the San Joaquin Valley Air Basin. An Ozone Attainment Demonstration, Redesignation Request, and Maintenance Plan has been prepared which shows that Eastern Kern County has attained the one hour National Ambient Air Quality Standard (NAAQS) for ozone. The USEPA has accepted the document and they approved it in April 2004. The USEPA recently classified the area as a federal nonattainment area for the new eight-hour ozone standard. This ozone nonattainment area includes the southern portion of the Rudnick Common Allotment, the Hansen Common Allotment, the Antelope Valley Allotment, the Warren Allotment, Bissel Allotments, the southwestern portions of the Cantil Common Allotment and the west portion of the Boron Sheep Allotments. Livestock grazing is not identified as an issue for the ozone nonattainment area.

Maintenance/attainment plans have been prepared for all of the PM10 planning areas which identify sources of PM10 emissions and control measures to reduce emissions. Livestock grazing is addressed in these PM10 plans. The north edge of the Lava Mountain Allotment, the northeast corner of the Cantil Common Allotment and the entire Spangler Hills Allotment fall within the Trona PM10 Maintenance Area. The East Kern Stock Driveway, the northwest portion of the Cantil Common Allotment and north portion of the Rudnick Common Allotment fall within the Indian Wells Valley PM10 Maintenance Area. The Inyo County Stock Driveway is within the

Coso Junction PM10 Maintenance Area. The south portion of the Lava Mountain Allotment, the southeast edge of the Cantil Common Allotment, the Monolith Cantil Allotment and the east portion of the Boron Sheep Allotment are in the San Bernardino County PM10 Nonattainment Area. The southern portion of the Rudnick Common Allotment, the Hansen Common Allotment, the southwest portion of the Cantil Common Allotment, the west portion of the Boron Sheep Allotment, the Bissel Allotment, the Antelope Valley Allotment and the Warren Allotment are unclassified for PM10.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

Fugitive dust could occur due to the soil disturbance as a result of the trampling action of the sheep when soil moisture levels are low. Using the inventory in the SIPs it is estimated that the proposed action would generate 3.8 tons of PM10 in the San Bernardino County nonattainment area, 21.3 tons in the Trona, Coso Junction and Indian Wells Valley Maintenance areas and 10 tons in the unclassified areas. Support vehicle use on the access roads will generate small amounts of PM10 emissions throughout the grazing area and could carry soils onto the paved roads which would increase entrainment emissions. PM10 emission levels are addressed in the PM10 SIPs. Ruminant animals emit methane gas which is a precursor emission for ozone. The ozone attainment plan did not identify this source as significant. PM10 emissions as a result of the proposed grazing activities are estimated to be well below the 100 ton significant level in any of the PM10 planning areas. Ozone precursor emissions are expected to be minimal. No significant offsite impacts are anticipated. Control measures are included to reduce fugitive dust emissions from the proposed project. The proposed project doesn't exceed the de minimus emission levels, is addressed in the SIPs and is exempt from conformity determination (40 CFR Part 93.153 (iii)) which exempts continuing and recurring activities such as permit renewals where activities will be similar in scope and operation to activities currently being conducted. As a result no further conformity analysis or determination is necessary.

Irreversible and irretrievable commitment of resources

No irreversible or irretrievable commitment of air resources would result.

Residual Impacts

Residual impacts to air quality include an increase in dust emissions from vehicle activity and grazing operations and hydrocarbon and combustion emissions from ruminant animals and internal combustion engines during the spring grazing operations. No long term residual adverse effects on air resources are expected from the proposed action. The impacts are expected to occur during the duration of the proposed grazing. Once the action is completed the site should return to pre grazing emission levels.

2. Impacts of Proposed Action

Same as for Current Management.

3. Impacts of no Grazing

Same as for Current Management.

4. Cumulative Impacts

The cumulative effect area for air resources for the proposed action is the Trona, Indian Wells Valley and Coso Junction PM10 Maintenance areas, the Owens Valley and San Bernardino County PM10 nonattainment areas and the East Kern County Ozone nonattainment area. The expected emission levels are within the levels in the attainment demonstrations in the SIPs and the cumulative NAAQS 24 hour and one year PM10 emission standards and the one hour ozone emission standards and are not likely to result in or contribute to exceedences of the National Ambient Air Quality Standards.

c. Consultation

Identify persons or agencies contacted and summarize results of consultation. Describe status of any legally required consultations (eg, Sect 7) including date consultation initiated. If biological opinion has been issued, incorporate by reference and attach as appendix.

d. References

Listed at the end of the document

B. AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)

a. Affected Environment

The management plans for these presented Goals and Objectives with specific Actions to achieve them. Each plan is different because the reasons for establishing them are different. Sheep grazing generally affects any ACEC in which it is permitted. Table B1 lists some of the ACECs potentially impacted.

Table B1

ACEC	Date	Acres	Resource Affected	Other Activities	Trends in Resources	Comments
DTNA	1980	25,000	Wildlife, T&E	No grazing, mining, motorized vehicles	Up	Sheep grazing entirely trespass animals
Jawbone-Butterbredt	1980	155,435	Wildlife, T&E, Cultural	Mining, OHVs, cattle grazing, Open Area	Down, impacts from OHVs exacerbating grazing impacts	Cattle grazing. plus ephemeral grazing allowed
Bedrock Springs	1980	784	Cultural	Archaeological studies	Unknown	Unknown if sheep graze in ACEC
Christmas Canyon	1980	8,540	Cultural	Archaeological studies, OHV activity	Slightly down, OHV activity impacting sites	Unknown if sheep graze in ACEC
Last Chance Canyon	1980	5,274	Cultural	Hunting, OHV touring, some mining	Unknown, graze & OHV activity impacting sites	Bedding and grazing impacting to cultural sites

The Jawbone- Butterbredt ACEC is a complex area containing two Open Areas, a Closed area, Wilderness Areas, habitat for federally listed species (tortoises, southwestern willow flycatchers), a designated route network and falls under the Rudnick Grazing allotment. BLM is completing Rangeland health assessments on the allotment. Riparian and wildlife monitoring is ongoing in the ACEC. The DTNA was fenced to exclude grazing, OHV activity and mining but there has been occasional sheep and OHV trespassing in recent years. The cultural ACECs were established to protect the archaeological resources but OHV activity and sheep grazing has impacted the resources. Sheep grazing, especially bedding continues to impact some of the surface sites.

Jawbone-Butterbredt ACEC

The Jawbone-Butterbredt ACEC falls within the Rudnick Common Allotment. “Sensitive and significant Native American heritage and religious sites were identified in portions of the ACEC during preparation of the CDCA Plan. These sites were historically used by the Kawaiisu for traditional religious purposes. Kawaiisu people in Bakersfield, Kernville, and Tehachapi have expressed concern and interest in preserving and protecting these traditional religious sites”

(USDI, BLM 1982:9). In regards to other cultural resource values, "...the management area contains several identified areas of very high archaeological and historical values. These archaeological resources have high potential scientific interest, aesthetic and interpretive value, and many have Native American traditional concerns. Many of these sites may be eligible for placement on the National Register of Historic Places" (Ibid.:9). The ACEC management plan also stated that, "the existing uses are compatible but must be limited or reduced in portions of the area to reverse degradation of cultural resource values...especially near water sources, riparian zones..." (Ibid:9). Identification and recordation of all cultural resources within the ACEC, called for in the plan (p. 17), has never taken place, nor have the required efforts to stabilize or rehabilitate damaged sites or salvage sites that cannot be saved. Descriptions of cultural resources and Native American values present within the ACEC are discussed more fully in the relevant sections of this document.

Bedrock Spring ACEC

The Bedrock Spring ACEC falls within the Lava Mountain Allotment and was established "to protect prehistoric cultural resources: middens, petroglyphs, pictographs, rock shelters, and milling features" (USDI, BLM, 1987:1). The ACEC also contains a series of historic sites that were recorded after establishment of the ACEC. These sites are primarily related to water development for travel through the major canyon within the ACEC or for range use. At the time the management plan was written it was thought that the "ACEC receives incidental grazing use primarily when shepherds move their flocks along the major wash" (Ibid:3).

Christmas Canyon ACEC

The Christmas Canyon ACEC falls within Spangler Hills Allotment and was designated to protect prehistoric archaeological resources within an OHV open area (USDI, BLM, 1988). When the management plan was written, a total of 18 prehistoric sites had been recorded. "Most of the sites are associated with the procurement and reduction of chert, including an extensive quarry. The artifacts exhibit varying degrees of patination, and many are associated with desert pavement. Milling stones have been identified with some lithic scatters. About 7% of the ACEC has been inventoried for archaeological resources, and additional inventory is expected to yield many more sites" (USDI, BLM 1988:4). Additional inventory did not take place, however, until impacts from OHV use in the ACEC prompted concern for cultural resources. Since then, nearly 4000 acres have been inventoried inside and adjacent to the Christmas Canyon ACEC. An additional 100 sites were recorded, including some unusual site types such as rock alignments, 119 stacked stone features, and several rock shelters. Recent study has also identified the presence of intact portions of a Pleistocene/Early Holocene (8,000-12,000 years ago) landscape, upon which some of the archaeological sites are located, so resources within the ACEC have the potential to illustrate lifeways of very early human populations in the area.

Last Chance Canyon ACEC

The Last Chance Canyon ACEC falls within the Cantil Common Allotment. It was established to protect historic and prehistoric resources spanning at least 5,000 years of human history (USDI, BLM, 1982b:1). The archaeological resources are part of a much larger archaeological district that was listed in the National Register of Historic Places in 1971. Archaeological sites within the ACEC at the time it was established included prehistoric villages and campsites, petroglyphs, milling stations, lithic quarries and workshops, rock shelters and isolated artifacts (USDI, BLM, 1982b:2). Historic sites in the ACEC relate to mining which began in the 1890s and was especially active during the Depression (Ibid:2). Sheep grazing was identified as one of the activities that had "taken their toll" (Ibid:2) on archaeological resources in the ACEC.

b. Environmental Consequences

1. Impacts from Current Management

Direct and indirect impacts: Detailed discussions of environmental impacts to cultural resources and native American concerns within the ACECS are discussed in the relevant Cultural Resources and Native American sections. Impacts to wildlife will also be discussed more thoroughly under that section, therefore, the analysis under the ACEC section will be general.

Proposed Mitigation:

These are listed under the respective resource impacted. A list of Terms and Conditions are provided for the desert tortoise so that no additional mitigation is called for here. These are listed in Appendix 4. Cultural may have a list of mitigation in the Cultural Section. These will help reduce the impacts to wildlife and cultural resources.

Residual Impacts:

Impacts to the ACECs can be ascertained by reviewing the impacts from the respective Wildlife and Cultural resources sections of this EA. The ACECs are listed above.

Irreversible and Irretrievable Resources:

The ACECs themselves will continue to exist even though impacts from grazing and other activities degrade them. Resources within the ACECs will likely be affected by grazing and should be looked at for their analysis. Grazing is not likely to cause the resources in the ACECs to irreversibly disappear.

Cumulative Impacts:

The ACECs in question are affected by other activities, primarily OHV activity in the case of Jawbone- Butterbrecht ACEC. This activity is permitted in some of the ACEC Plans, either on designated routes or designated open areas. This activity can have far-reaching impacts, as discussed in the desert tortoise impacts section. Cattle- grazing is also permitted within the Jawbone- Butterbrecht ACEC and Sand Canyon ACEC, adding to the impacts from grazing.

2. Impacts of Proposed Action

Direct and Indirect Impacts: Impacts are similar to Current Management except that impacts from grazing will be less in the Archaeological Register Historic District.

Proposed Mitigation:

These will be similar to Current Management.

Residual Impacts:

Residual impacts will be similar except for slightly fewer residual impacts in the Historic District.

Irreversible and Irretrievable Resources:

The major difference would be in the potential loss of cultural resources, less under this alternative.

Cumulative Impacts:

These would be similar to the Current Management.

3. Impacts of No Grazing

Direct and Indirect Impacts:

None

Proposed Mitigation:

None

Residual Impacts:

None

Irreversible and Irretrievable Resources:

None

Cumulative Impacts:

None

C. BIOLOGICAL SOIL CRUSTS

a. Affected Environment

Biological soil crusts are likely to occur over most of the study area. Soils with these crusts are often referred to as cryptogamic soils. The open space between higher plants is not generally bare of all life. Highly specialized organisms make up a surface community consisting of cyanobacteria, green algae, lichens, mosses, microfungi and other bacteria. The cyanobacteria and microfungal filaments weave through the top few millimeters of soil holding loose soil particles together forming a biological crust which stabilizes and protects soil surfaces. The biological crusts aid moisture retention, fix nitrogen, and may discourage the growth of annual weeds. Below the surface, the soil flora grow various rhizines, hyphae and filaments that further bind the soil together. Most of the biological crust organisms make their growth during cool moist conditions.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

It is thought that the low to mid-elevation arid ecosystems in the west developed with low levels of surface disturbance. As a result the crusts in these areas are easily disturbed by trampling by grazing animals which apply compressional and shear forces. The crust response to these disturbances is highly variable. Moisture and burial are two important factors relating to the degree of impact. Moist crusts are better able to withstand disturbances than dry soils. Many of the biological crust species are not mobile and cannot survive burial. This results in the loss of most mosses, lichens, green algae and small cyanobacteria. The large, filamentous cyanobacteria can move 5mm per day if it is wet and can survive if it is wet. The general result of burial is a greatly simplified crustal community due to the loss of species. Grazing in the late winter and spring can reduce both species diversity and cover of biological crusts because the soils are dry. These allotments have been grazed for over one hundred years and it is likely that continued grazing would not make any appreciable additional changes in the biological crust species diversity. The watering down of the handling facilities (corrals and shipping facilities) would allow at least partial recovery of the biological crusts on those sites.

Irreversible and Irretrievable commitment of Resources:

Biological soil crusts can recover from disturbance over time. The time factor is dependent upon the degree of displacement and soil moisture. In moist conditions partial recovery of the mobile species can occur in days. More complete recovery of all species on a site can be from five to seventy years.

Residual:

The same as Direct and Indirect Impacts

Cumulative Impacts:

The long term result of continued impacts is a greatly simplified crustal community due to the loss of species.

Recommended Mitigation:

None

2. Impacts of Proposed Action

Direct and Indirect Impacts:

Same as Current Management

Irreversible and Irretrievable Commitment of Resources

Same as Current Management

Residual Impacts

Same as Current Management

Cumulative Impacts

Same as Current Management

Recommended Mitigation

Same as Current Management

3. Impacts of No Grazing

Direct and Indirect Impacts:

A slow recovery of the less mobile crust species would occur.

Irreversible and Irretrievable commitment of Resources:

Biological soil crusts can recover from disturbance over time. The time factor is dependent upon the degree of displacement and soil moisture. In moist conditions partial recovery of the mobile species can occur in days. More complete recovery of all species on a site can be from five to seventy years.

Residual:

Same as direct impacts

Cumulative Impacts:

The long term result of removing grazing impacts is a more complex crustal community due to species recovery.

Recommended Mitigation:

None

C. References

Listed at the end of the document

D. CULTURAL RESOURCES

a. Affected Environment

Walker Pass Common Allotment

Efforts to identify cultural resources within the Walker Pass allotment have been largely restricted to inventory for historic and prehistoric archaeological materials, in which it is extremely rich. The allotment is situated on the east slope of the Sierras and runs from near the crest down to the valley floor. It contains a series of riparian canyons. These canyons were foci of prehistoric habitation and use as people moved seasonally up and down slope to make use of seasonally available plant and animal species. The allotment, therefore, coincides almost exactly with the primary habitation patterns of prehistoric populations. It is well watered compared to adjacent areas and contained numerous useable plant and animal species, as well as other resources of importance to prehistoric populations. In addition, the Walker Pass area was an important travel corridor over the mountains, focusing activity in its vicinity. Archaeological site densities are extremely high, indicating heavy use of the area by prehistoric populations. Historic archaeological materials are also present in high numbers, indicating that this area was early recognized by historic populations as having resources of value.

There are nearly 100 recorded archaeological sites within the allotment and a number of other known but unrecorded sites. Approximately 1% of the allotment has been formally inventoried. The largest inventory effort to date was carried out by Los Angeles Department of Water and Power (LADWP) on its aqueduct facilities and access roads, and the majority of recorded sites result from this effort (Bevill *et al* 2003). The aqueduct crosses at or near the mouths of all of the drainages within the allotment and many prehistoric sites were recorded in these areas. Very little inventory has been carried out further up the drainages and almost no inventory in the upland areas. Inventory in these areas would very likely produce many unrecorded resources.

Important site complexes exist in the lower reaches of all of the major canyons, including Freeman, Indian Wells, Grapevine, Sand, Ninemile, and Fivemile. The upper reaches of Short Canyon contain important prehistoric resources. These resources include permanent habitation sites (villages), temporary campsites with house rings and milling features, lithic scatters, hunting camps, and rock art (petroglyphs and pictographs). The prehistoric sites represent essentially the full range of prehistoric site types typical of the area. The allotment may be characterized archaeologically as a perfect example in microcosm of general prehistoric habitation patterns in this part of the desert. Consequently, the value of the allotment for understanding the prehistory of the area is extremely high.

While most of the archaeological resources have never been evaluated for listing in the National Register of Historic Places, without doubt the prehistoric complexes in the watered canyons would be found eligible if evaluated. A strong case could be made for identifying much of the allotment as a National Register District given the value of the area for explicating prehistoric land use, settlement and resource procurement patterns over a wide range of elevations. Many of the historic resources are associated with construction of the Los Angeles Aqueduct. Evaluation of the aqueduct and related sites for National Register eligibility is currently underway and the aqueduct and many associated sites will soon be formally National Register eligible or listed properties. Fifty-six archaeological sites within the allotment, both prehistoric and historic, are currently being evaluated for National Register eligibility as part of the LADWP aqueduct inventory. While eligibility determinations have not yet been made, more than half of the sites have been recommended as eligible thus far.

Rudnick Common Allotment

Efforts to identify cultural resources within the allotment have focused on discussion of sacred and traditional concerns on the part of Kawaiisu people and inventory for historic and prehistoric archaeological resources. Native American concerns will be discussed in that section.

The Rudnick allotment is rich in archaeological resources. . The allotment runs from the valley bottom up the east slope of the Sierras and over the crest to Kelso Valley on the west slope. It encompasses a variety of environmental zones and contains a series of riparian canyons. These canyons were foci of prehistoric habitation and use as people moved seasonally up and down slope to make use of seasonally available plant and animal species. The allotment, therefore, coincides with the primary habitation patterns of prehistoric populations. It is well watered compared to adjacent areas and contained numerous useable plant and animal species, as well as other resources of importance to prehistoric populations. In addition, Walker Pass, on the northeastern side of the allotment, and Bird Spring Pass, on the northwest side of the allotment, were important travel corridors over the mountains, focusing activity in their vicinity. From these travel corridors people fanned out across the east slope of the Sierras, especially into the vicinity of the watered canyons. Archaeological site densities are unusually high, indicating heavy use of the area by prehistoric populations. Historic archaeological materials are also present in high numbers, indicating that this area was early recognized by historic populations as having resources of value.

Until recently, inventory within the Rudnick allotment for cultural resources was quite sparse. Several recent efforts have increased our level of inventory considerably. In 2002 and 2003 inventory was carried out by BLM archaeologists on many of the vehicle routes within the Jawbone-Butterbrecht ACEC for purposes of route designation and maintenance, and for rehabilitating unauthorized routes. In 2003, archaeological inventory was carried out on a corridor along the First and Second Los Angeles Aqueducts (Bevill and Nilsson 2004 Draft). In 2002 and 2003, BLM contracted with URS Corporation to do a Class III (100%) inventory of the Jawbone and Dove Spring Open Areas and a Class II (sample) inventory of the Jawbone-Butterbrecht ACEC (Bevill and Nilsson 2004 Draft). The latter inventory covered 2000 acres within the Jawbone OHV Open Area, 3300 acres within the Dove Spring OHV Open Area, and 5,185 acres (approximately 5%) of the Jawbone-Butterbrecht ACEC outside the open areas. Because the allotment encompasses large areas outside the Jawbone-Butterbrecht ACEC the total coverage within the allotment is still less than 5%. However, enough data has been collected for a large portion of the allotment to be able to draw some conclusions about archaeological resources within the allotment.

Approximately 216 prehistoric and historic archaeological sites have been formally recorded within the allotment. A number of other sites are known about but not formally recorded. Prehistoric site types and constituents include permanent or seasonal habitation sites; house rings; ground stone such as manos, metates, and bedrock milling areas; rock art (petroglyphs/pictographs); ceramics; projectile points; flaked stone tools and residue from producing the tools; burials; and other cultural manifestations. Prehistoric archaeological manifestations represent the entire gamut of daily activities that would have been carried out by native populations. Historic materials include pottery, rock walls and features, foundations, structures, mine shafts and adits, rock cairns, historic trails and roads, rock quarries, dumps, tin cans and other metal items, and bottle glass. Many of these sites are associated with construction of the First and Second Los Angeles Aqueducts. Others are associated with early mining efforts and some may be associated with early grazing activity.

None of the sites within the allotment have been formally evaluated for eligibility for listing in the National Register of Historic Places, although sites along the Los Angeles Aqueducts are currently in the process of evaluation. Many of the known sites would undoubtedly be found to be eligible if formally evaluated since they exhibit characteristics that indicate the potential to yield important information, a criterion for being listed in the National Register of Historic Places. Recent inventory and initial evaluation of archaeological sites within the Jawbone-Butterbrecht ACEC (Bevill and Nilsson 2004) has shown that archaeological sites within the area would yield information on distribution of archaeological sites in relationship to natural resources, prehistoric chronology of the area, subsistence patterns and use of natural resources, and technology and exchange patterns. All of these are key areas of investigation to further our understanding of prehistoric life within the general region. Historic sites can yield information on the range of historic activities that took place in the area, including mining, travel and transportation, ranching, and important technological innovations associated with construction of the Los Angeles Aqueduct, which was a major significant historic event to the region (Bevill and Nilsson 2004; Bevill *et al* 2003).

Site densities encountered during the Jawbone-Butterbrecht ACEC inventory range from 1 site per 31 acres to 1 site per 118 acres (Bevill and Nilsson 2004:90). Informal plotting of recorded sites against areas exhibiting various levels of cattle activity shows a high correlation between areas with high site densities and areas of high or moderate cattle usage. These tend to be riparian areas, springs, areas containing denser vegetation of types that are favored by cattle and that were of most use to prehistoric populations, and ecotonal areas with a variety of resources. Denser site complexes exist within Sage Canyon, Bird Spring Canyon, Dove Spring Canyon, Jawbone Canyon, and along Kelso Creek.

Hansen Common Allotment

This allotment lies on an ecotone that stretches from alluvial valley bottom into higher elevations containing significant natural resources, including a number of springs, pinyon and other important plant resources, and good quality stone for manufacture of tools. Existing resource identification is limited to inventory for archaeological materials. Inventory was focused on two routes through the area, one hiking and the other a four-wheel-drive route, and amounts to a very small portion of the entire allotment. Approximately 40 archaeological sites have been recorded, consisting primarily of lithic scatters and quarries at which stone was procured and tools manufactured and/or used. Milling implements for processing plant foods were found at some of these sites. Stacked stone features and roasting pits have also been identified. A number of the sites are identified as seasonal occupation sites or hunting camps. The area was probably used seasonally for procurement of pinyon nuts, an important staple in prehistoric diets, and other plant foods, hunting, and procurement of good quality stone while in the area. None of these sites have been formally evaluated for National Register status. Additional inventory in the area would likely yield many more sites. Existing inventory did not include areas at most of the springs, where more complex habitation sites might be expected.

Primary Sheep Allotments

These allotments contain several areas of known archaeological significance. On its east side, the Cantil Common Allotment encompasses most of the Last Chance Canyon National Register District and ACEC. The ACEC is contained within the National Register District. The National Register District was officially listed in 1971 and is the earliest National Register property in the California Desert District. It encompasses approximately 110 square miles (a small portion of which was transferred to Red Rock Canyon State Park as a result of the 1994 California Desert

Protection Act). With extremely minimal formal inventory, over 250 sites have been formally recorded. However, information has been collected over the past 25 years on many more sites that have not been formally recorded. The area contains a number of prehistoric rock shelters and primary habitation sites that are characterized by deep cultural deposits. Excavation of one such site in the 1980s showed occupation in the area to date back as far as 5000 years. Recent research efforts by BLM archaeologists, Maturango Museum of Ridgecrest, and UCLA that cover relatively small acreages have shown these areas to be characterized by extremely high site densities and a wide variety of site types, including permanent or seasonal habitation sites, resource procurement and processing sites such as milling stations and stone tool quarries, rock shelters, stacked stone features, petroglyphs, house rings, and a possible semi-subterranean structure. Current knowledge indicates that the area contains an extremely dense, varied and important prehistoric archaeological resource. Each inventory effort yields important new discoveries. The ACEC also contains a number of historic structures and features relating to mining from the 1880s to the Depression.

The Christmas Canyon area on the west side of the Spangler Hills Allotment and the Lava Mountains, containing the Bedrock Spring ACEC, are also areas that are known to contain important prehistoric resources (see ACEC affected environments above for details). The shore of Koehn Lake may also contain important prehistoric resources but little investigation has been carried out there to confirm this.

Antelope Valley Allotment and Warren Allotment

Little information is available for these scattered sections of BLM land. The sections on the flat valley bottoms are likely to have low potential for archaeological resources except where natural water sources exist. Those segments on the hill slopes at the edge of the Tehachapi Mountains have greater potential for presence of archaeological resources.

b. Environmental Consequences

1. Impacts of Current Management

General discussion of how grazing impacts archaeological resources is available. The following discussion is taken from Environmental Assessment Livestock Grazing Authorization, EA Number CA 170-03-54, BLM Bishop Field Office, December 2003.

Livestock use impacts on cultural resources include: displacement (vertical and horizontal) and breakage of artifacts, and the mixing of depositional associations through trampling; destruction or enhanced deterioration of structures and features through rubbing; and an acceleration of natural erosional processes. Plants valued by Native American traditionalists could be trampled or consumed by livestock, adversely affecting plant availability at some locations. For purposes of analysis it is assumed that the impacts of livestock use are distributed in proportion to the actual distribution of livestock, with the most intensive impacts occurring at livestock use concentration areas. Cultural resources located on lands having erosional or other types of watershed deterioration problems attributed to livestock use impacts are assumed to receive high impacts. Cultural resources are non-renewable, and impacts of livestock use on cultural resources are cumulative (USDI, BLM 1982).

Relatively few studies have been undertaken to address the impacts of domestic livestock grazing to archaeological resources (Archaeological Sites Protection and Preservation Notebook: Technical Notes (ASPPN) I-15; Osborn et al. 1987; Roney 1997; Thomas D. Burke personal communication [to Kirk Halford, ed. note] 1998), with more emphasis being placed on the effects of human trampling in site formation processes (see Nielson 1991). Nonetheless, the same conclusions have been drawn from these studies as summed by Nielson (1991).

Intensive trampling modifies the horizontal distribution of artifacts, it obscures patterns existing in their original deposition, and eventually introduces new trends in their spatial arrangement. By producing vertical migration of materials it also can move artifacts across stratigraphic units, and mix in the same deposit items originating in different occupations. When trodden, artifacts undergo several types of damage, like breakage, micro-chipping and abrasion. The resulting traces sometimes mimic the damage produced by use or by other post-depositional processes and therefore can lead unwittingly to erroneous functional interpretations (Nielson 1991:483-484).

Variables influencing the level of impact at any given site include: 1) soil type (e.g., hard or rocky soil substrates will lead to greater artifact damage and horizontal displacement); 2) soil moisture (e.g., wet soils will lead to greater vertical displacement and stratigraphic mixing); 3) vegetation type/ground cover (depending on site landform specifics, erosion may increase as vegetation cover decreases resulting in significant secondary impacts); and 4) intensity of grazing.

The studies reviewed here are experimental tests of trampling impacts (Archaeological Sites Protection and Preservation Notebook: Technical Notes (ASPPN) I-15, 1990; Nielson 1991; Osborn et al. 1987; Roney 1977). All of the studies found that smaller artifacts (< 2 g [ASPPN 1991]) tend to migrate vertically more readily than larger artifacts thus biasing site interpretation in cases where no subsurface analyses are involved. In a controlled experiment within a portable corral, Roney (1977) found that after 40 hours, in which 78 cows were rotated through the corral, that only 5% of 60 flaked stone artifacts could be found on the surface. The hard soil substrate was churned to a fine dust to 5 cm (depth, approximately 2 inches, ed. note), 81% of the artifacts were horizontally displaced up to .75 m (meters [approximately 2 feet], ed. note) and 48% were damaged and broken. Roney (1977) concluded that "...cattle do produce significant physical damage to lithic artifacts."

Nielson (1991), in his assessment of human trampling, found the same trends with top soil loosening occurring in 1-2 cm (depth, approximately 1 inch or less) on a hard soil substrate with subsoils being compacted. Again smaller items tended to migrate downward, but were less apt to move horizontally than large specimens. Sixty percent of the lithic debitage (stone flakes from tool manufacture, ed. note) showed damage ranging from abrasion, microflaking, and breakage. As would be expected, ceramics showed the greatest level of impact with a random distribution of sizes being reduced to a skewed, unimodal distribution dominated by smaller size classes less than 30 cm (12 inches, ed. note) in diameter. We can predict that cattle impacts would be highly magnified over Nielson's (1991) results from his studies on human trampling, but would follow the same trends.

In field visits Tom Burke (personal communication 1998), owner and principal investigator of Archaeological Research Services, Inc., has found cattle grazing to have "substantial adverse effect to archaeological site integrity." In heavy use areas mixing can occur up to 10-20 cm (centimeters; 4 to 8 inches, ed. note) in most conditions and up to 30-40 cm (12 to 16 inches, ed. note) in wet conditions. The author's investigations corroborate Burke's assessments. As would be expected, Burke has found impacts to be highest in areas where cattle tend to congregate such as springs, water courses, troughs, shade zones, and salt licks. The zone of impact around such features extends from 25-100 meters (approximately 75-300 feet, ed. note), with a linear pattern of roughly 25 to 50 meters (approximately 75 to 150 feet, ed. note) following stream courses. Field assessments in the Bishop Field Area support these observations.

In summary, it can be concluded that livestock grazing can have adverse effects to archaeological resources causing artifact damage, movement, and mixing. In the case of standing structures, cattle rubbing or scratching can cause severe impacts causing structure degradation and collapse (Chuck Fell, Bodie State Historical Park, personal communication 1995). Intensity of grazing, soil hardness, moisture, vegetation cover, and type are factors influencing the level and types of impacts. Erosion is a secondary impact resulting from grazing that can also have negative effects to cultural sites. The areas of greatest concern are those locations where livestock congregate and tend to spend a large percentage of the time. In zones where livestock are more dispersed, such as upland locations, it can be predicted that impacts will be mainly surficial, causing no stratigraphic mixing, but perhaps resulting in horizontal displacement of artifacts. In rocky areas and zones without sufficient feed very little to no cattle impact is expected to occur (field observation 1999). (The above discussion taken from USDI, BLM 2003.)

While most of the studies sourced above relate to cattle grazing, sheep grazing produces some of the same results. Soil characteristics can be changed by the presence of large bands of sheep. Placement of watering sites, bedding sites, and other sheep management facilities may have severe impacts on archaeological materials at those locations. While no formal monitoring for effects has been carried out, observations have been made by archaeologists working in the sheep grazing areas. These observations have included movement or disappearance of artifacts that had been recorded immediately prior to the time the sheep came through an area, breakage of artifacts, churning of the ground surface and/or pocking of the ground surface, and deposition of organic materials that would affect some kinds of scientific analysis or prehistoric materials. In one case, a two-track road into a study area was obliterated by a band of sheep that passed through during the time the study was going on. BLM archaeologists observed a sunken area through a large site that at first appeared to be a historic roadbed but proved to be the route along which a band of sheep had recently been driven. Because sheep are herded and kept bunched, while cattle disperse across a landscape, in some circumstances sheep grazing may be more disturbing to resources than cattle. Additionally, anecdotal observation by BLM archaeologists and researchers over the last 2 or 3 years appears to indicate an increase in observed impacts from sheep. This may be due to the fact that some sheep grazing areas have been lost because of desert tortoise habitat, so that remaining areas are being grazed more intensively. At 5 sheep per AUM, the 3680 AUMs allowed in the Cantil Common Allotment amounts to 18,400 sheep. That many sheep passing over archaeological resources lying on the ground surface are likely to have significant impacts.

Recommended Mitigation

All range improvements that have not been previously inventoried for cultural resources or that are modified, repaired, moved, upgraded, etc. will be inventoried for cultural resources prior to work on the improvement.

Any new improvements will be inventoried for cultural resources prior to construction. The proposed locations of such will be moved to avoid impacts to cultural resources as needed.

The following mitigation from the Livestock Grazing Amendment should be incorporated into the grazing permit if this alternative is selected, to be used as inventory identifies impacts to cultural resources:

Standard Protective Measures will be carried out as inventory identifies effects to cultural resources. If these measures can be effectively applied, no evaluation or further consultation with SHPO will be required. In situations in which these measures will not address effects, consultation with SHPO will be initiated.

Standard Protective Measures can include but are not limited to:

- A. Fencing or enclosure of livestock from the cultural resource sufficient to ensure long-term protection, according to the following specifications:
 - 1. the area within the enclosure must be inventoried to locate and record all cultural resources; and
 - 2. the enclosure (i.e.) fence must not divide a cultural resource so that a portion is outside of the fence; and
 - 3. the cultural resource specialist will determine the appropriate buffer to be provided between the cultural resource and its enclosing fence.
- B. Relocation of livestock management facilities/improvements at a distance from cultural resources sufficient to ensure their protection from concentrated grazing use.
- C. Removal of natural attractants of livestock to a cultural resource when such removal, in the judgment of the cultural resource specialist, will create no disturbance to the cultural resource (e.g. removing vegetation that is providing shade).
- D. Removal of the area(s) containing cultural resources from the allotment.
- E. Livestock herding away from cultural resource sites.
- F. Use of salting and/or dust bags or dippers placement as a tool to move concentrations of cattle away from cultural sites.
- G. Other protective measures established in consultation with and accepted by SHPO.
- H. Conduct yearly monitoring to ensure that treatment measures are effective.

2. Impacts of Proposed Action

Following the terms of the Livestock Grazing Amendment, establishing designated locations for grazing management facilities, carrying out the inventory and monitoring program in the Last Chance Canyon National Register District, and adjusting grazing as determined necessary by the results of these actions should halt or significantly reduce impacts to cultural resources. If it is found that implementation of the Amendment and other actions will not achieve acceptable results, consultation between BLM and the State Office of Historic Preservation and Native Americans will be designed to do so.

3. Impacts of no Grazing

Selection of this alternative would eliminate further direct impacts to cultural resources. Damage that has already occurred may continue to degrade resources through the action of soil erosion and other such effects.

4. Cumulative Impacts

Many other activities affect cultural resources, including vehicle use, especially OHV recreation; camping, hiking, and other recreational activities; maintenance of roads, transmission lines, and other facilities; artifact theft and site vandalism.

c. Consultation

Consultation with the State Historic Preservation Officer will be required as outlined in the grazing appendix to the state Protocol Agreement and will largely take the form of annual reports on progress and measures taken to avoid, eliminate, or mitigate impacts to cultural resources. Other individuals or groups who may have traditional or cultural concerns about the area will be contacted as they are identified or as they identify themselves to BLM

d. References

Listed at the end of the document

E. ENVIRONMENTAL JUSTICE

a. Affected Environment

The grazing allotments being analyzed are located in rural Kern and Inyo counties. The rural areas of these counties are typically occupied by moderate to low-income households. The lessees that hold the grazing leases for the allotments being analyzed typically have moderate incomes. Seasonal laborers that may be hired by the lessees generally come from low-income households

b. Environmental Consequences

1. Impacts of Current Management

The implementation of the proposed action would have an affect but not a disproportionate affect on low-income or minority populations living on or near the allotments being analyzed.

The grazing of livestock in rural Kern and Inyo counties has been a common practice for over 100 years. Typically, sheep grazing has been performed by persons of low to moderate income, and may or may not be considered a minority. There are no Native American communities on or near any of the allotments being analyzed.

2. Impacts of Proposed Action

The impacts of the proposed action on environmental justice would be the same as for current management.

3. Impacts of no Grazing

Under the no grazing alternative there would be an affect but not a disproportionate affect with respect to low-income or minority populations. The loss of livestock grazing in rural Kern and Inyo counties could result in the loss of seasonal employment to a very small component of low-income or minority populations.

4. Cumulative Impacts

There are no known cumulative impacts to low-income or minority populations as a result of current grazing practices or the proposed action. The no grazing alternative may have some cumulative present and future impacts to a very small component of low-income or minority populations.

c. Consultation

All affect Native American tribes with traditional ties to the lands within the allotments being analyzed would be consulted.

F. FARMLANDS, PRIME OR UNIQUE

a. Affected Environment

The proposed action and alternatives would have no affect on unique or prime farmlands because there are no lands so designated in the allotments.

G. FLOOD PLAINS

a. Affected Environment

The proposed action and alternatives would have no affect upon flood plains because there are no designated flood plains within the allotments.

H. INVASIVE, NON-NATIVE SPECIES

a. Affected Environment

The definition of “weed” is always debatable. Traditional definitions include “plants out of place” or “plants that by their presence conflict with management objectives for the site.” The BLM definition also incorporates the concept of public land health and sustainability and reads: “A weed is defined as a non-native plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition and diversity of the site it occupies. Its presence deteriorates the health of the site, makes efficient use of natural resources difficult, and it may interfere with management objectives for that site. It is an invasive species that requires a concerted effort (manpower and resources) to remove from its current location, if it can be removed at all.” “Noxious” weeds refer to those plants which have been legally designated as unwanted or undesirable. This includes national, state, and county or local designations.

According to the Federal Noxious Weed Act of 1974 (7 U.S.C. 2802(c)) native plant species are not designated “noxious”. In addition to the state and national noxious plants lists, BLM has issued a “BLM National List of Invasive Weed Species of Concern”. In a 1995 Memorandum of Understanding between the BLM and other federal agencies and the State of California, Priority would be placed on eradication, control or containment of “A” rated weed species and localized infestations of “B” and “C” rated weeds according to California Administrative Code 4500. According to the State of California Department of Food and Agriculture, “A” rated Noxious weeds are to be eradicated, contained or refused entry, “B” rated Noxious weeds are more widespread, and therefore more difficult to contain and eradication is left up to local county Agricultural Commissioners and “C” rated Noxious weeds may be so wide spread that the state does not endorse eradication or containment.

Invasive/Noxious Weeds Sheep Allotments Table 1			
Common Name	Scientific Name	CDFA Rating	CalEPPC Rating
tree of heaven	<i>Ailanthus altissima</i>	C	A-2
downy brome(cheat grass)	<i>Bromus tectorum</i>		A-1
Moroccan mustard	<i>Brassica tourenfortii</i>		A-2
halogeton	<i>Halogeton glomeratus</i>	A	Red Alert
Perennial pepperweed	<i>Lepidium latifolium</i>	B	A-1
salt cedar	<i>Tamarix ramosissima</i> (&others)	C	A-1
red brome grass	<i>Bromus (rubens)</i> <i>madritensis Ssp.</i> <i>rubens</i>		A-2
Tocalote or Malta starthistle	<i>Centaurea melitensis</i>	C	B
black mustard	<i>Brassica nigra</i>		B
punchervine	<i>Tribulus terrestris</i>	C	
Russian thistle	<i>Salsola tragus</i>	C	
tansy mustard	<i>Descurania sophia</i>		
Mediterranean mustard	<i>Hirschfeldia incana</i>		
Mediterranean grass	<i>Schismus arabicus</i>		
Mediterranean grass	<i>Schismus barbatus</i>		

Inventory work, conducted over the last several years has detected more than twenty species of noxious/invasive/non-native species on or adjacent to public lands within the Ridgecrest Field Office. Eleven of those species occur on or adjacent to sheep grazing allotments (table 1). Some of these species are quite widespread in the area and are found in all of the sheep allotments. Red brome, cheat grass and Arabian grass are consistently found through out the region. These three grass species are widespread in areas that have not had grazing and areas that have not been grazed for over 50 years. Infestations of some of the other weed species range in size from single plants to thousands of plants covering hundreds of acres. Three of those species are rated noxious weeds (tree of heaven, salt cedar and Russian thistle) by the state of California. Tree of

heaven and salt cedar have been identified for control in the area. Range expansions have been noted at several sites for salt cedar. Inventory work has detected a nearly ten fold increase in the area infested by salt cedar in the past ten years. Bossard et al (2000) note that the “presence of salt cedar is associated with dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition and native wildlife diversity.” The non-native annual grasses such as cheat grass, red brome and Arabian grass are thought to deteriorate wildlife habitat values by out-competing the more desirable native forbs for nutrients and space.

These allotments have seen over 130 years of grazing.. In the 60 years prior to the Taylor Grazing Act (1934), large herds of both cattle and sheep used the area with no regulation. Some historical records indicate that over 20,000 head of cattle and nearly 1,000,000 head of sheep used the area during the early years. The relation of livestock grazing to the invasions of weed species and their continued maintenance varies by species. A common trait of the more invasive noxious weeds is their ability to rapidly invade into habitats and completely displace the native species. This dominance is displayed by salt cedar. Arabian grass favors disturbed sites and heavy sheep grazing seems to increase its dominance on high use sites (like corrals, bedding areas and watering areas. As the species is already wide spread in the desert, continued grazing is not changing the range of the species. As a contrast, the spread of some species into the desert has no evidence of livestock being the vector. In 1844 John Fremont crossed the desert entering over Tehachapi Pass. Fremont was one of the first European men into the region. He noted that Filaree (*Erodium cicutarium*) was a common species at that time. This was a number of years before livestock entered the area. Current new invader species such as Yellow star thistle and Sahara mustard seem to be following highway corridors into the desert.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

Sheep grazing could influence noxious/invasive weeds several ways. These possible influences could include transporting new species in from other regions, moving seeds from infested sites within the allotment to non infested sites and by modifying sites to be more favorable to weed germination/growth. The movement and introduction of new species have a low probability. Although the sheep are shipped from areas which may have noxious/invasive weed populations, the risk is small because the sheep would be shipped prior the seed set on the noxious/invasive weeds. In addition, the sheep are typically shorn before they are shipped reducing the opportunity for the sheep to transport seed in the wool. Most existing noxious/invasive weed species are widespread and have been for a long time. Species such as filaree were noted as widespread in 1844, prior to livestock grazing. Salt cedar is of limited range, but it is not spread by livestock grazing. Current livestock management is unlikely to cause any additional spread. Sheep grazing can modify high intensity use sites to provide a more favorable environment for the weeds. Observations at sites where animals have been held in a corral have noted a dominance of the more weedy species from the surrounding area and clipping studies have noted higher biomass productions on the disturbed site the following year. The current management calls for the use of previously used sites. This would limit the development of new sites.

Irreversible and Irretrievable commitment of Resources:

The introduction of exotic species, especially noxious weeds is very difficult if not impossible to reverse. Some of the noxious weeds have the potential to totally dominate a site. The probability of new livestock caused noxious/invasive weed populations or species is very low.

2. Impacts of Proposed Action

Same As Current Management

2. Impacts of no Grazing

Direct and Indirect Impacts:

No annual or perennial vegetation would be trampled or removed by sheep. There would not be any expected changes in vegetation composition on an overall basis. Some high impact type sites may increase their perennial cover. Standing Biomass levels could increase. Additional biomass could increase the incidence and/or intensity of fire. Selecting the no grazing alternative would not be expected to result in any appreciable changes in the occurrence of current non native species.

Irreversible and Irretrievable commitment of Resources:

With no grazing there would be no use of vegetation.

Residual:

The same as Direct and Indirect Impacts

Cumulative Impacts:

OHV use would continue to impact vegetation in some areas.

Recommended Mitigation:

None

c. References

Listed at the end of the document

I. NATIVE AMERICAN CONCERNS

a. Affected Environment

The bulk of the area encompassed by the sheep allotments was inhabited at contact by the Kawaiisu. The Kawaiisu, who had cultural affinities with both California and Great Basin culture areas, occupied a core area that included the Tehachapi Mountains, portions of the Kern River Valley, and the Walker Pass area. Outer areas, probably important seasonally, included

the eastern Sierra Canyons, such as Grapevine, Sand, Indian Wells, etc. Linguistic and other evidence indicates that the Kawaiisu may have been in this area for a very long time, at least 2000 years. (Archaeological evidence indicates that the area has been inhabited for at least 6000 to 8000 years.) In support of long habitation of the area Zigmond noted that the Kawaiisu lack migration tales (Zigmond 1972:134), unlike many tribal groups, whose migration tales retell the story of their arrival in their current homeland. The Kawaiisu were hunter-gatherers who practiced no incipient agricultural techniques. A detailed ethnobotany was published by Zigmond in 1972. A summary of Kawaiisu culture is available in Zigmond 1986. Zigmond is the only ethnographer to have studied the Kawaiisu in any depth and they are in general not well represented in the ethnographic literature. They followed a more or less standard seasonal round of collecting plants for foods and other purposes and hunting. Winter houses were circular structures of willow and brush; summer homes may have been little more than brush shade structures. They were skilled basket makers but pottery was seldom made or used by them. Social organization was centered on the family group with little evidence of tribal organization or formal leadership. Their religion is little known but there were a number of powerful Kawaiisu rain or weather shamans, the last of whom, Bob Rabbit, lived in Kelso Valley in the 1940s. The Kawaiisu were probably never a large group; Kroeber (1925) thought the aboriginal population might have been 500; by 1925, there were perhaps 150. Zigmond (1986) thought that all Kawaiisu tribal life had disappeared by the 1960s. "The only criterion for a modern census is language. On this basis there appeared to be about 30 Kawaiisus scattered throughout southern California in 1984...There was only one married couple where both members were Kawaiisu...As a tribal entity the Kawaiisu have ceased to be" (Zigmond 1986:410). While not a federally recognized tribe, the Kawaiisu are recognized by the State of California and a number of people of Kawaiisu descent still live there in Tehachapi and adjacent areas. Recently a Kawaiisu cultural center was established in Tehachapi and Kawaiisu language classes were being taught. There are individuals who still speak the native Kawaiisu language. Because Native Americans used the area contained within the allotment extensively and there are many manifestations of Native American use present, it is probable that descendants of earlier populations will have some concerns about the area.

The northern portion of the Walker Pass allotment has usually been identified as ancestral homeland of Western Shoshone people, while the southern end falls within the area attributed to the Kawaiisu. The Western Shoshone occupied a vast territory to the east of the allotment, with the allotment falling on the far western fringe of their territory. Western Shoshone settlement and subsistence was largely based upon small family or extended family groups who moved seasonally through large territories to exploit a wide variety of resources. They coalesced at certain times of the year, particularly in the fall and winter, for group hunting and other activities, settling down for the winter in more or less permanent habitations (villages). (For detailed descriptions of Western Shoshone settlement, subsistence, and other cultural patterns and activities see Fowler *et al* 1995; Grosscup 1977; Kroeber 1925; Steward 1938; and Thomas *et al* 1986.)

b. Environmental Consequences

1. Impacts of Current Management

Consultation with Native Americans will determine whether or not there may be significant differences in impacts between the proposed action and current management.

2. Impacts of Proposed Action

Kawaiisu and Shoshone people through the consultation process will identify these impacts.

3. Impacts of no Grazing

Cessation of grazing would result in cessation of any direct on-going impacts that may be occurring. There may still be effects resulting from permanent damage to resources or areas of concern that will remain even after grazing ceases. These matters must be identified by Native Americans with knowledge of the area. Impacts to sacred values may be permanent since these values may not be recoverable or restorable by any physical steps to improve local conditions. This alternative would also eliminate an activity that may be considered a historic use in the area and may have adverse impacts on the traditional values of those engaged in the activity

4. Cumulative Impacts

Grazing has been going on for so long that impacts to Native American values are likely to have a cumulative effect. Some resources of importance may have been eliminated from the environment or seriously degraded, such as populations of native plants. Areas with sacred values may have been permanently compromised by cattle grazing and attendant activity. The combination of grazing and other activities in the area, such as maintenance and use of the Los Angeles Aqueduct, transmission lines and access roads, and recreation and OHV activities may be significant. These matters must be identified by Native Americans with knowledge of the area.

c. Consultation

Consultation with Native Americans is required under the Protocol Agreement and under various laws and executive orders. Federally recognized and state recognized tribes and individuals whose traditional homelands may be affected by cattle grazing on these allotments have been contacted. Consultation will continue with those who identify concerns about the area. Western Shoshone tribes in the Owens Valley who have identified interest in the study area have been contacted but consultation has not begun. There is no formal Kawaiisu tribal organization but a number of individuals have been contacted regarding grazing permit renewal.

J. RECREATION

a. Affected Environment

The diverse terrain and environments found on the public lands in these allotments provide a wide range of outdoor recreational opportunities and experiences including backpacking/hiking, horseback riding, mountain biking, camping, hunting upland game birds as well as large mammals, nature study, birding, ATV and motorcycle riding, four-wheel driving, rock hounding/mineral collecting, photography and target shooting. Also within the Rudnick Common allotment is roughly 30 miles of the Pacific Crest Trail (PCT), a hiking and equestrian use only trail that stretches for more than 2,000 miles from the Mexico border all the way to Canada. This hiking trail receives hundreds of visitors annually some just out for a day hike to others that plan on hiking the whole 2,000 miles. Additionally the El Paso Mountain and Golden Valley Wilderness areas are within the Cantil Common, Spangler Hills, and Lava Mountain allotments. Refer to the Wilderness section for details.

Jawbone Canyon and Dove Springs Open areas are located within the Rudnick Common allotment while the Spangler Hills Open area is within the Cantil Common and Spangler Hills allotments. These designated open areas are the three most popular off-highway vehicle recreation areas managed by the Ridgecrest Field Office. Annual visitation to these locations is estimated to be in the hundreds of thousands per year with people traveling predominantly from southern and central valley regions of California. Visitors to these areas partake in such recreational activities as camping, motorcycle touring, ATV riding, and four-wheel driving.

Within the borders of these allotments annually Special Recreation Permits are issued to guides and promoters of such events as dual sport motorcycle tours, endurance equestrian rides, and ultra marathon running events. The 65,000 acres of the Spangler Hills Open Area is annually used by about ten clubs of the American Motorcycle Association to conduct motorcycle races during the fall, winter, and spring seasons. Event participants may encounter livestock while participating in the many various permitted events that occur within grazing allotments. To avoid unanticipated encounters between man and livestock and to reduce safety hazards both Special Recreation and grazing permittees should be notified of the others presence in the areas being used and provide with appropriate maps.

b. Environmental Consequences

1. Impacts of Current Management

While participating in casual and permitted recreational pursuits participants may encounter such range improvements as fence lines, closed gates, cattleguards, corrals and water developments as well as encountering livestock on the public lands. While range improvements such as closed gates and cattleguards may delay ones recreational pursuits these impediments do not create a significant impact on recreational opportunities. Conversely the sighting of livestock grazing on the open range is often very intriguing and of interest to visitors and enhances one's recreational experience.

2. Impacts of Proposed Action

Same as for Current Management

3. Impacts of no Grazing

The elimination of grazing would have little effect on recreational opportunities in the region except for eliminating the experience of seeing livestock on the open range of the "Wild West.". Until all range improvements were removed recreational participants may still encounter the remnants of these developments which may delay but not prohibit pursuing one's recreational interest.

4. Cumulative Impacts

No cumulative impacts would be experienced by participants while partaking in recreational opportunities with in the allotments.

K. SOCIAL AND ECONOMIC VALUES

a. Affected Environment

The herding of sheep in rural Kern and Inyo counties during the ephemeral growing season is a practice that is over 100 years old. Sheep grazing has been an integral part of the agricultural community in these counties. In decades past, far more sheep were grazed than are currently. In 2003 approximately 18,000 ewe-lamb pairs were grazed on public land in the Ridgecrest Field Office area which is fraction of what has been traditionally grazed. In the past few decades sheep operations have been competing with the growth of populations in the desert and a change in values that reflects a change in recreational pursuits and attitudes. As a result of this sheep ranching is declining as a component of the agricultural economy.

Sheep ranching is a labor intensive industry, not because it requires great numbers of people to accomplish it, but because it requires a great deal of “sweat equity” by a few people. The investment in machinery is low compared to other forms of agriculture, but the margin of profit is narrow in today’s internationalized market. As a result, small changes in the parameters of the sheep operator’s world can have a profound affect on whether or not sheep ranching is a viable enterprise.

b. Environmental Consequences

1. Impacts of Current Management

Economically the impacts of the Current Management alternative would be that sheep ranchers continue in the same traditional ways trying to make a declining industry profitable.

Socially, the communities that pay attention to sheep ranching would remain divided. There are those in the community that would like to see sheep grazing stopped altogether because of the negative impacts on the desert environment. Likewise, there are those who hold the view that sheep ranching is a traditional and honorable business that provides a valuable product. They would tend to attribute fewer adverse impacts to the environment.

2. Impacts of Proposed Action

The proposed action would have no further economic impacts on sheep ranchers if the sheep grazing management facilities (such bedding and watering sites, loading sites, herder camps and corrals) were designated prior to authorizing grazing with the Last Chance Canyon National Register District (LCCNRD). If grazing management facilities sites cannot be designated then the economic impact would be significant to the permittees because approximately 50% of the grazing in Cantil Common would be affected and grazing privileges would have to be redistributed. In short, the grazing “pie” would be cut in half but still have to feed the same number of operators. This could conceivably cause serious affects on the viability of some ranchers operations even though they do not graze the desert every year and the time they do graze constitutes only one-sixth of their grazing year.

Over the last 13 years (1991-2003) there have been 26,886 AUMs grazed in Cantil Common Allotment. Of these AUMs in Cantil Common Allotment, 12,790 (48%) were grazed in the LCCNRD. Over the same time period, there have been a total of 130 bands of sheep grazed in Cantil Common of which 62 (or 48%) have grazed in the LCCNRD (see Table A).

Table A: Total Bands & AUMs in Cantil Common, & Bands & AUMs in LCCNRD

Grazing Year	Total # Bands in Cantil Common	# Bands Grazed in LCCNRD	Total # AUMs Grazed in Cantil Common	# AUMs Grazed in LCCNRD
1991	21	8	4959	2445
1992	19	11	4018	2016
1993	23	11	4933	1855
1995	16	8	2223	1581
1998	19	8	3254	1450
2001	15	7	3364	1517
2003	17	9	4135	1926
'91-'03 Totals	130	62	26,886	12,790
	% Bands in Cantil Common Grazed in LCCNRD 48%		% AUMs in Cantil Common consumed in LCCNRD 48%	

It is not within the capability of this analysis to quantify accurately the potential impact of this alternative on the local economy, but it is probably not severe. If the grazing management facilities sites are designated prior to authorizing grazing then the economic impact is negligible.

3. Impacts of no Grazing

It is not within the capability of this analysis to accurately quantify the potential impact of this alternative but the Kern and Inyo counties would lose a traditional component of their agricultural heritage.

4. Cumulative Impacts

There are no cumulative socio-economic impacts as a result of current management. There no cumulative impacts on the local economy as a result of the proposed action. With the no grazing alternative the region would lose a rich tradition,

L. SOILS

a. Affected Environment

Soils in the area are poorly developed, are generally well drained and coarse textured. Some portions of the Monolith Cantil Allotment are internally drained resulting in a number of small playas with surface clays, surface physical soil crusts and increased salinity . The soil depth ranges from deeper alluvial materials to very shallow or non existent over the rocky substrate. The soils are susceptible to accelerated erosion from wind and water especially when the surface has been disturbed. Much of the soil has been subject to periodic disturbance due to sheep grazing for 140 years. Historic evidence indicates that historic use levels exceed current use by more than ten times. Additional soil disturbance is occurring as a result of intensive OHV use which occurs in the Spangler Hill, Dove Springs and Jawbone Canyon OHV Open Areas where OHV free play occurs. In addition, the entire area receives heavy OHV use.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

Direct impacts to soils would occur through vertical and horizontal displacement and mixing as a result of the grazing activities. Additional direct impacts would include compaction and a reduction in pore space and infiltration rates. Different impacts would occur to soils from different portions of the grazing operation. Watering sites and management facilities both concentrate the sheep into a small area resulting in nearly continuous trampling impacts to those sites. The trampling would not cause any changes to the soils in the roads. However, adjacent to the roads the impacts would include increase compaction in the soil surface, elimination of vegetative cover, and destruction or disruption of biological soil crusts. It is estimated that these concentration area impacts would occur on approximately 750 acres spread over all of the allotments in one to three acre sites. The proposed action limits these types of sites to areas on and adjacent to roads and on previously impacted sites. As opposed to the intense use at watering and management facilities, the general grazing use is an extensive use with the animals and their hoof action spread over large areas. The Mojave Desert Air Quality Management District (MDAQMD 1995) estimated PM10 emissions from sheep grazing. They used a USDA model and California Air Resources Board methodology and estimated that approximately 1% of the grazing areas was being impacted each year. This use can be best characterized as a series of small impacted spots (hoof marks) with large areas of interspace. This use would not result in the loss of vegetative cover or increased compaction and reduced infiltration rates. It would result in a small increase in wind and /or water erosion potential.

Indirect impacts would occur as increase soil erosion from water and wind. The movement of soils by water during high flow events would occur both on the intense use areas and down associated drainages. The movement would involve both removal and deposition. The deposition could occur on the sites, adjacent to the site, along or in roads and through out the drainage. As most of the intense use sites are on shallow slopes, the increased water erosion is expected to be negligible and very localized. Wind erosion could occur on disturbed sites during the common high wind events in the spring. Wind erosion would result in losses of small particles from the surface and increased particulate emissions. The wind erosion losses diminish over time as the small particles are lost from the surface. Erosion rates would only slightly exceed natural rates.

Irreversible and Irretrievable commitment of Resources:

Soil losses due to the proposed action are irreversible and irretrievable.

Residual:

The proposed action would result in a partial loss of soils from some specific sites.

The proposed grazing activities would contribute little to any soil losses occurring in the region. Many of the proposed grazing intense use sites are already being used for OHV and camping uses. Most of the regional erosion problems come from poor drainage on and adjacent to roads and trails.

Recommended Mitigation:

None

2. Impacts of Proposed Action

Same as Proposed Action

3. Impacts of no Grazing

Direct and Indirect Impacts:

Elimination of grazing would eliminate any additional impacts to soils as a result of sheep grazing.

Irreversible and Irretrievable commitment of Resources:

Elimination of sheep will eliminate that commitment of soil resources.

Residual:

The same as Direct and Indirect Impacts.

Cumulative Impacts:

Eliminating grazing activities would make little changes in soil losses occurring in the region. Many of the possible grazing intense use sites are already being used for OHV and camping uses. Most of the regional erosion problems come from poor drainage on and adjacent to roads and trails.

Recommended Mitigation:

None

4. Cumulative Impacts

c. References

Listed at the end of the document

M. SPECIAL STATUS PLANTS:

a. Affected Environment

There are ten special status plant species are known in the study area. These are the Desert cymopterus (*Cymopterus deserticola*) and Barstow Woolly Sunflower (*Eriophyllum mohavense*) which occurs in the Boron Sheep Allotment, the Red Rock poppy (*Eschscholtzia minutiflora ssp twesselmanii*) and Charlotte's phacelia (*Phacelia nashiana*) which occurs in the Rudnick and Cantil Common Allotments, the Spanish Needle onion (*Allium shevockii*), Mojave tarplant (*Hemizonia mohavensis*) and Kelso Creek monkeyflower (*Mimulus shevockii*) which occur in the

Rudnick Common Allotment and the Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*) and Piute Mt. jewel flower (*Streptanthus cordatus* var. *piutensis*). The Spanish Needle onion, Kelso Creek monkeyflower, Kern buckwheat and Piute Mt. jewel flower all occur outside areas where sheep will access. Most of these species occur on sites which have historically been regularly grazed by sheep. There is some evidence that Desert cymopterus is receiving adverse impacts from sheep grazing in the Boron Sheep Allotment. All of these species are on the BLM special status list but do not have state or federal status.

b. Environmental Consequences

1. Impacts of Current Management:

Direct and Indirect Impacts:

Some incidental grazing may occur on one population of Red Rock poppy in Mesquite Canyon along the south side of the El Paso Mountains. This incidental use is not expected to jeopardize the continue existence of this population or the species. Grazing has impacted desert cymopterus in the Boron Allotment. It is unknown what the long term impact grazing is having on the overall health of the desert cymopterus.

Irreversible and Irretrievable commitment of Resources:

Special status plant populations can be lost if actions result in loss or modification of the habitat necessary for their existence. If habitat losses occur at many sites then the species could be eliminated. The proposed action could result in habitat modifications at one known site for the desert cymopterus. It is unknown to what degree or what the overall impact would be from that impact. As only one population is known to be impacted on BLM, it is not expected to jeopardize the continued existence of the species.

Residual:

The same as Direct and Indirect Impacts

Cumulative Impacts:

Grazing has occurred for over 100 years. However, it is unknown what cumulative impacts are likely to occur to the desert cymopterus from the proposed grazing use.

Recommended Mitigation:

Monitor the special status plant populations for adverse impacts.

2. Impacts of Proposed action:

The proposed action would result in few changes in impacts to special status plants from the existing situation.

3. Impacts of no Action:

No special status plants will be impacted by this alternative.

c. References

Listed at the end of the document

N. WASTE, HAZARDOUS OR SOLID

a. Affected Environment

Detailed surveys of hazardous or solid wastes have not been undertaken on this allotment. BLM maintains no records of reportable spills in the allotment. Although use of motorized vehicles and equipment by the livestock operator may have resulted in periodic and scattered spills or releases of fuel and petroleum products in the allotment, none are documented. For this reason we believe that the proposed action and the alternatives would have no affect on hazardous or solid waste.

O. WATER QUALITY, SURFACE AND GROUND WATER

a. Affected Environment

Except for a few situations, all water used by the sheep is trucked to the sheep from water purchased from various sources. The sheep use areas are mostly upland sites with few permanent waters or wetlands. Only the Cantil and Rudnick Common Allotments have permanent surface waters. The Cantil Common Allotment contains a number of small seeps and springs in the El Paso Mountains. Most of the sites are small and do not support any wetland. There is a small riparian area at Willow Spring and a salt grass area near sheep springs. Most of these springs and seeps have been developed for wildlife water. Sheep Springs was developed in the 1930s for livestock use. The site currently contains concrete sheep troughs and an old rock rubble water tank built by the Civilian Conservation Corps (CCC). Sheep Springs has historically been used to water sheep, but recently the sheep use has created a conflict with hunting interests who want the site used exclusively for watering upland game. The Rudnick Common Allotment has a number of developed watering sites in addition to springs, seeps and/or running water in many of the Sierra canyons. There is no evidence that any the wetland sites have been adversely impacted by sheep grazing. There is also evidence of an old dried up spring development at Bedrock Spring at the south end of the Spangler Hills Allotment.

A number of wells exist in the Cantil and Rudnick Common Allotments. Most of the wells were developed with windmills to support livestock grazing. High vandalism rates have made nearly all of the wells useless for livestock use. Inyo, Black Hills, Searles, Rinaldi and Last Chance wells are currently used as monitoring wells as part of ongoing ground water studies in the Indian Wells Valley. In the Rudnick Common Allotment, the Horse Canyon, Highway and Dove wells are within the sheep grazing area. All three of these had windmills and were vandalized. There is discussion on rebuilding Dove and Highway Wells with sub-pumps for cattle use. Freeman Well caved in and no longer exists. Studies indicate that the depth to water in the El Paso Mountains ranges from under 20 to 40 feet. The depth to water on the flats west and north of the El Paso Mountains is nearly 300 feet.

The storm water flows from the study area end up in one of several closed basins. The Final Unified Watershed Assessment (1998) identified three large watershed basins in the study area. These are the Indian Wells-Searles Valley basin, the Antelope-Fremont Valley basin and the Coyote-Cuddeback Lakes basin. It classified all three of the watersheds as category I impaired low priority watersheds. This classification indicated that these watersheds are impaired but of a

lower priority to receive Clean Water Action Plan grants from the federal Nonpoint Source Program.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

The proposed actions do not represent point source impacts to water quality and no 401 permit is necessary. Impacts from the proposed action represent non-point-source impacts which are controlled by Best Management Practices (BMP). A number of the existing grazing stipulations and practices represent BMP under the clean water act. These practices include maintenance of cover, limiting high impacting uses to previously used sites, limits on season of use, limiting number of passes and limits on utilization. These BMPs reduce sedimentation and increase infiltration rates. Both of these are desirable and are positive steps toward solution of the impaired watershed classification for all of the watersheds represented by the proposed action.

Irreversible and Irretrievable commitment of Resources:

Sediments represent soil losses which are very slow to recover. Water lossess from the watershed are not recoverable and are not available for plant growth and groundwater recharge.

Residual:

Same as direct impacts

Cumulative Impacts:

Grazing represents only a small portion of the non-point-source pollution in the watersheds and the BMPs are not likely to change the impaired classification for the watersheds.

Recommended Mitigation:

Do not abandon the wells

2. Impacts of Proposed Action

Same as Current Management

3. Impacts of no Grazing

No impacts to water resources would occur.

c. References

Listed at the end of the document

P. WETLANDS/RIPARIAN ZONES

a. Affected Environment

There are no major riparian areas within the sheep- grazing areas. Sheep tend to graze out on the open flats and rolling hills, generally away from riparian areas. There are a few small riparian areas within the normal sheep- grazing areas, but these tend to be avoided. There are a number of small developed springs in the El Paso Mountains, but many of these are fenced. The development at Sheep Springs fills a large cement tank that is often drained by the herder to water sheep at this site. The diversion reduces the vegetation at the spring head but has been in place since the 1930s for sheep use. However, volunteers have maintained this water development for wildlife. Sheep are generally watered by tank trucks elsewhere, so there is normally little impact on the small riparian areas. There is not sufficient water at the small springs to water the 800+ sheep typically found in a band. It's likely that in the past water was used from these by the herders for water for their camps. Water was also used by hunters, equestrian, OHVs, and others, as well, so impacts can't be attributed solely to sheep grazing.

b. Environmental Consequences

1. Impacts of Current Management

Direct and indirect impacts:

Sheep grazing is generally a "No Affect" for most of the small springs and seeps. However, Sheep Spring in the El Paso Mountains is being impacted. The vegetation around the tank is trampled when sheep are in the area. There is no data on the impacts of sheep grazing on the small springs and seeps in the sheep allotments, but they are either fenced or not used by the herders.

Irreversible and Irretrievable Resources:

None.

Recommended Mitigation:

None

Residual:

None

Cumulative Impacts:

Springs and seeps were historically impacted by people obtaining water for personal use. Many water sources were impacted by development for "wildlife water". Sheep herders probably used them to obtain water for camp use. Volunteers maintain the seeps and springs that are developed. Sheep grazing contributes additional impacts to the cumulative impacts for this resource since the vegetation around Sheep Spring is impacted when sheep are in the area.

2. Impacts of Proposed Action

Impacts will be the same as for Current Management except for the following difference. In the Cantil Allotment, the BLM will designate, in coordination with sheep operators, where grazing management facilities sites for sheep bands may be located prior to authorizing grazing in the ARHD. If the watering and bedding sites are distant from Sheep Springs, the impact of sheep on this spring will be diminished and will be limited to impacts occurring only if sheep are trailed near Sheep Springs.

Irreversible and Irretrievable Resources:

None.

Recommended Mitigation:

None

Residual:

None

Cumulative Impacts:

Same as current management

3. Impacts of No Grazing

Direct and indirect impacts:

None

Irreversible and Irretrievable Resources:

None.

Recommended Mitigation:

None

Residual:

None

Cumulative Impacts:

None

c. References

Listed at the end of the document

Q. WILD AND SCENIC RIVERS

a. Affected Environment

The proposed action and alternatives would have no affect on wild and scenic rivers because there none in the sheep allotments.

R. WILDERNESS

a. Affected Environment

There are 11 sheep allotments up for renewal at this time. Three of the eleven extend into wilderness. They are the Cantil Common, Lava Mountain, and Spangler Hills allotments. The Cantil Common Allotment (319,063 acres) encompasses the entire El Paso Mountain Wilderness (23,780 acres) and approximately one-third or 10,964 acres of the Golden Valley Wilderness. The Lava Mountain Allotment (20,873 acres) covers most of the rest of the Golden Valley Wilderness (20,412 acres), except for 4,373 acres in the wilderness' northeast corner which falls in the Spangler Hills Allotment (65,151 acres). About 11% of the Cantil allotment falls inside wilderness. 98% of the Lava Mountain Allotment is inside wilderness. And, 7% of the Spangler Hills Allotment falls inside wilderness.

The El Paso Mountains Wilderness is located 6 miles southwest of Ridgecrest, CA. Numerous reddish-colored buttes and dark, uplifted volcanic mesas dissected by narrow canyons distinguish this wilderness. Badlands topography surrounds Black Mountain, the central feature of this wilderness. The area is notable for its remarkable number of prehistoric and historic cultural sites, which need to be protected from vandalism and decay. There is a well-known concentration of exceptional petroglyphs at Sheep Springs. The southern portion of the wilderness is included in the Last Chance Archeological District and is listed on the National Register of Historic Places. Vegetation primarily consists of creosote bush scrub. Specialized habitats with special status plant species do occur. The Red Rock poppy (*Eschscholtzia minutiflora ssp. twesselmanii*) is found only in the El Paso Mountains. The Red Rock tarweed (*Hemizonia arida*) can be found there as well. In springtime, the area is known for its wildflower displays, showy orange mariposa lilies (*Calochortus kennedyi*) and breathtaking expanses of purple desert hyacinths (*Dichelostemma capitatum*). There are no known noxious weed populations in the area. The wilderness area has few if any springs outside of Sheep Springs. However, there are 9 functional and dysfunctional bird guzzlers in the area. Wildlife includes raptors, state-threatened Mojave ground squirrels, and the federally-endangered desert tortoise. Cultural sites, vegetation, and wildlife are all affected by sheep grazing.

The wilderness is a popular camping, hiking, equestrian, bird hunting, rock hounding and wildflower viewing area. Many people tour the perimeter of the wilderness area by vehicle to picnic, visit the Sheep Springs petroglyph site, and view the often spectacular, spring wildflower displays. Each year several equestrian as well as motor vehicle events circumnavigate the boundary. Local equestrians from Inyokern and Ridgecrest frequently ride throughout the area. Hunters will ride horseback or walk into the guzzler sites and canyons to shoot dove, quail, and chukar. The area is still a favorite collecting spot for rock hounds (who must now walk in) and for Maturango Museum volunteers seeking specimens for the annual wildflower show. Hikers

tend to focus on climbing Black Mountain which is on the Sierra Club Desert 101 Peaks list. Black Mountain is also used by China Lake Search and Rescue for training exercises in wilderness evacuations. Approximately 28 old vehicle ways comprising 21 miles of former vehicle route have been closed throughout the area; more than two-thirds of them successfully. Several of these ways were used to access guzzlers and rock-hounding areas. Virtually all cross sensitive archeological sites. There are still some persistent OHV trespass problems along the open, western front of the range off of Inyokern Road. Otherwise, the El Paso Mountains Wilderness is largely natural and pristine with excellent opportunities for experiencing naturalness, solitude, and primitive and unconfined recreation despite the high level of general activity.

Currently there are only 2 dysfunctional wells of Civilian Conservation Corp (CCC) vintage in the area just inside the boundary along Inyokern Road. They are Freeman Wash and Black Hills Wells. There are no plans to re-drill or otherwise make these wells functional at this time. Nor are any new range developments being proposed. Shepherders haul water in trucks for their sheep along this road and other wilderness perimeter roads in the El Pasos. The only exception to this practice is the well and trough outside of wilderness near Sheep Springs. All shepherd camp wagons, stock and water hauling trucks are stationed outside of wilderness. Sheep operations do not require motorized access or the use of motorized or mechanized equipment, or any other action normally prohibited under the Wilderness Act. Sheep however do forage extensively and will bed down in wilderness. There are 9 wildlife developments (bird guzzlers) in addition to the two CCC wells inside the El Paso Mountains Wilderness.

The Golden Valley Wilderness is located south of the Spangler Hills Open Area approximately 10 miles southeast of Ridgecrest, CA. Golden Valley is noteworthy for its spectacular spring wildflower displays. The valley is encircled by two mountain ranges. The Lava Mountains crowned by Dome Mountain at nearly 5000 feet enclose the valley on the northwest. The Almond Mountains rising to an elevation of 4500 feet enclose the valley on the southeast. These ranges are cut by several steep-walled canyons marked by bands of multi-colored sedimentary rocks. The ruggedness of these mountains help shelter the valley from human intrusion although vehicle trespass or spillover from the Open Area continues to be a significant problem. Vegetation consists primarily of creosote bush scrub community with Joshua trees and numerous annuals. Specialized habitats with special status plant species (solitary blazing star, *Mentzelia eremophila*) do occur. There are no known noxious plant communities. Nor are there any known riparian areas. Vegetation is affected by visitor use (primarily OHV trespass) and authorized activities, such as sheep grazing. The wilderness provides nesting and foraging habitat for raptors and habitat for the desert tortoise and Mojave ground squirrel. There are several significant cultural sites in the area, notably at Steam Well which has a superb concentration of rock art, and at wilderness sites associated with Bedrock Springs.

The wilderness is a popular camping, hiking, wildflower viewing, rockhounding and bird hunting area. A concerted effort has been made to complete signing, barricading, and reclamation of the estimated 20 old vehicle ways entering this wilderness. The old route leading into the Steam Well petroglyph site has been transformed into a foot trail. Numerous sites along the northern boundary have been reworked and barricades beefed-up with some success at stemming the tide of vehicle trespass. A plan is being developed to harden barriers with wing fences and pedestrian-equestrian gates as needed. Despite the continuing problems with OHV trespass along the northern boundary of this wilderness where it comes close to abutting the Spangler Hills Open Area, much of the interior of this wilderness remains largely natural and pristine, offering ample opportunities for solitude, cross-country hiking across the valley floor

and up the flanks of the mountainsides, and other forms of primitive and unconfined recreation. Dome, Klinker, and Almond Mountains are all on the 101 Sierra Club Desert Peaks list.

Currently there are 2 dysfunctional wells (Steamwell and one unnamed well) inside the Golden Valley Wilderness. These wells are historic in nature and are not used for sheep grazing. There are no plans to re-drill or otherwise make these wells functional. No new range developments are being proposed inside of the wilderness area. Sheep operations do not require motorized access or the use of motorized or mechanized equipment, or any other action normally prohibited under the Wilderness Act. Shepherders haul water in trucks for their sheep along roads encircling the southern, western, and northern perimeters of the Golden Valley Wilderness. All shepherd camp wagons, stock and water hauling trucks are stationed outside of wilderness. Sheep however do forage extensively and will bed down in wilderness.

All sheep allotments are ephemeral in nature. This means they are assigned a nominal preference of 1 AUM with an unspecified number of AUMs suspended for ephemeral grazing. Sheep are not turned out to graze in these areas unless ephemeral forage meets the standard of 200 (dry) pounds per acre set by the Biological Opinion of 1994. It is estimated that 5 ewe-lamb pairs will eat the equivalent of 1 cattle AUM's worth of forage or 1,000 (dry) pounds of forage per month. Numbers of sheep are usually calculated by bands. A single band of sheep constitutes approximately 800 ewe-lamb pairs. The grazing season for sheep normally runs 65 days, beginning after the 20th of March and concluding by June 5th of each year, depending upon the availability of adequate forage.

Approximately 50% of all bands grazing in the Cantil Commons Allotment graze within the El Paso Mountains Wilderness and the Golden Valley Wilderness. 100% of all bands in the Lava Mountain Allotment and 33% of all bands in the Spangler Hills Allotment graze within the Golden Valley Wilderness. Current use-levels and those in-place at the time of designation (October 1994) of the El Paso Mountains Wilderness and Golden Valley Wilderness can be described as follows. Six to ten bands of sheep (approximately 4,800-8,000 lamb-ewe pairs) using an average of 2421 AUMs per year were grazed in wilderness on the Cantil Common Sheep Allotment in the years 1992, 1993, and 1995. Currently, an average of 9 bands (or approximately 7,200 lamb-ewe pairs) using an average of 1800 AUMs per year are grazed in wilderness on this allotment. Two bands of sheep (approximately 1,600 lamb-ewe pairs) using an average of 441 AUMs per year were grazed in wilderness on the Lava Mountain allotment in 1992, 1993, and 1995. Currently, two bands using an average of 408 AUMs per year are grazed in wilderness on this allotment. One band of sheep (approximately 800 lamb-ewe pairs) using an average of 241 AUMs per year were grazed in wilderness on the Spangler Hills allotment in 1992, 1993, and 1995. Currently, one band of sheep using an average of 250 AUMs per year are grazed in wilderness on this allotment. In 1994, sheep were not grazed on any of these allotments because ephemeral forage did not meet the standard of 200 (dry) pounds per acre.

There are no wilderness management plans for the El Paso Mountains and Golden Valley Wildernesses that address sheep grazing. The Cantil Common Allotment is the only allotment that has an Allotment Management Plan (AMP). No allotment management plans have been developed for the Lava Mountain and Spangler Hills Allotments.

b. Environmental Consequences

1. Impacts of Current Management

Sheep grazing is an authorized but non-conforming use in wilderness. Wilderness values are adversely affected both by loss of vegetative cover and resulting loss of naturalness and wildness (untrammelledness), and by the destruction of irreplaceable, cultural resources due to the foraging, trampling, and bedding down of sheep within these wilderness areas. Under this alternative, adverse impacts to wilderness character and values and to cultural resources in the El Paso Mountains and Golden Valley wildernesses are expected to continue at current high levels.

Sheep will be allowed to forage as well as bed down in cultural sites within wilderness. Sheep herder camps, watering trough sites, corrals, unloading and loading sites or any other action involving the use of motor vehicles or motorized/mechanized equipment, and/or temporary or permanent placement or construction of new range developments will not occur inside of any wilderness area.

All proposed actions in wilderness, including any future proposed actions, involving the use of motorized vehicles or motorized and mechanized equipment, structures, installations, or any other action normally prohibited under the Wilderness Act will require a separate, project-specific Environmental Assessment with a Minimum Action/Minimum Tool Analysis. For range structures and projects that are non-functional, an EA will determine first whether it should be replaced, reconstructed, maintained, or removed.

2. Impacts of Proposed Action

Impacts will be the same as under Current Management, except in the National Register of Historic Places Last Chance Archaeological District within the El Paso Mountains Wilderness. Here, sheepherders will be required to bed sheep in prescribed areas outside of any cultural sites. This will avoid some of the adverse impacts to cultural sites, but will not avoid adverse impacts to other wilderness resources. Moving sheep out of customary, already disturbed, bedding areas to protect important cultural sites will result in new, additional areas being disturbed within wilderness. Sheep will continue to forage and trample cultural and non-cultural sites in wilderness.

Sheep herder camps, watering trough sites, corrals, unloading and loading sites or any other action involving the use of motor vehicles or motorized or mechanized equipment, and/or temporary or permanent placement or construction of new range developments will not occur inside of any wilderness area.

All proposed actions, including any future proposed actions, in wilderness involving the use of motorized vehicles or motorized and mechanized equipment, structures, installations, or any other action normally prohibited under the Wilderness Act will require a separate, project-specific Environmental Assessment with a Minimum Action/Minimum Tool Analysis. For range structures and projects that are non-functional, an EA will determine first whether it should be replaced, reconstructed, maintained, or removed.

3. Impacts of no Grazing

The impacts of no grazing on wilderness would be to maintain and improve naturalness, untrammeledness, aesthetic and scenic qualities in the affected wilderness areas. No grazing would better protect and preserve adversely impacted cultural resources and opportunities for quality primitive and unconfined recreational experiences.

4. Cumulative Impacts

Under current management, adverse impacts to wilderness resources would be expected to accrue over time, particularly in regards to cultural resources within the Last Chance Archeological District in the El Paso Mountains Wilderness and at other sensitive cultural sites within the Golden Valley Wilderness.

Under the proposed alternative (current management with special conditions for the portions of the Cantil Common Allotment that are within the Last Chance Archeological District) some of the adverse effects on cultural resources within the El Paso Mountains Wilderness will be avoided. Sheep will still trample cultural sites while foraging, but attempts will be made to prevent sheep from bedding down in cultural sites within this wilderness. Adverse effects of bedding down sheep as well as foraging of sheep on cultural sites within the Golden Valley Wilderness will however continue unabated. Impacts on other wilderness resources, including impacts caused by the displacement of sheep from customary bedding sites, would be expected to accrue over time.

Under the no grazing alternative, naturalness and untrammeledness, aesthetic and scenic qualities, opportunities for primitive and unconfined recreation and the preservation and protection of significant cultural sites in wilderness would be improved and enhanced over time.

c. **Maps**

Maps of wilderness within sheep allotments, see allotment maps Appendix 1.

S. WILD HORSES AND BURROS

a. Affected Environment

The proposed action and alternatives would have no affect on wild horses and burros because there are no herd management areas within the allotments.

T. WILDLIFE (T&E)

a. Affected Environment

The list of species found within the sheep- grazing allotments includes listed species, special status species, and some very common ones. Jim Weigand (BLM, 2004) prepared a list of special status species for the Jawbone Butterbrecht ACEC OHV grant that covers similar habitat (Table 1W, in Appendix 4).

Special Status Species (Non-listed)

1. *Small mammals*- The rodent and rabbit populations fluctuate greatly depending on climate but can be affected by overgrazing, meaning that meeting rangeland health standards would allow these populations to fluctuate “normally”. BLM has determined that it will manage sensitive species to prevent them from becoming listed. The yellow-eared pocket mouse, a BLM sensitive species, has been recorded (Laabs et al, 1990) and is likely to do well in those areas that are meeting the range standards. A variety of bats (see Table 1W, Appendix 4) occur on the allotment. Foraging areas are important for bats, meaning there must be sufficient vegetation to provide the range of insects, spiders, and other invertebrates needed by the bats. Moths are a favorite food item of the Townsend’s big-eared bat, a species that could be proposed for listing in the near future. In general, if the upland plant community is meeting the rangeland health standards, it is likely providing sufficient foraging habitat for the bats.

2. *Upland bird species*- The group includes those that nest in this community, those that feed here (raptors), and those that migrate through and/or winter here (many). All the native bird species on the allotment are protected under the Migratory Bird Treaty Act, but some have additional status. Burrowing owls (BLM Sensitive) require a productive vegetative community in the vicinity of their nest (burrows) because they do not forage great distances as other raptors do. They do, however, prefer shorter vegetation adjacent (5- 10’) to their burrows. The LeConte’s thrasher is widespread over the allotment and is listed as a BLM Sensitive species. This species needs large shrubs, cactus, or Joshua trees for nesting and a productive vegetative community for foraging. Raptors, as a group, use this upland primarily for hunting prey, so they need a vegetative community that produces abundant rodents, rabbits, and other food. The prairie falcon, a BLM sensitive species, nests at Robbers Roost and other sites with steep cliff faces and forages over a wide area. For the upland species, meeting rangeland health standards indicates that their habitat needs are being met.

3. *Reptiles and amphibians*- This is a group that generally does well even under light grazing. The legless lizard is a California species of Special Concern but is found in or adjacent to washes and riparian scrub habitats.

4. *Large mammals and “game” animals*- Mountain lions, bobcats, and coyotes are scattered sparsely over the sheep allotments and feed mostly on native prey. Big and small game are hunted under CDFG regulations. Mule deer and black bear are found in the western edge of the allotments at the higher elevations. The main species of upland game birds are California quail, Gambel’s quail, mountain quail, chukar, and mourning dove. These are mainly ground-nesting birds, so there is the potential that sheep could crush their nests. However, most of the time nests are placed hidden from predators, allowing some protection. These mammal populations do, however, fluctuate with the weather, mainly precipitation, which translates into vegetation (food). The group is indirectly affected by factors that affect their food supply, such as heavy grazing on annuals.

Riparian associated species.

1. *Vertebrates*- The sheep allotments have relatively few riparian areas, and these are small and isolated. This makes them extremely important to migrating birds and birds that require surface water. Amphibians such as red-spotted toads are associated with the small riparian areas. Sheep tend to graze on flat or rolling open rangelands though and are usually watered away from these isolated sites. These springs do not produce enough water for a band of sheep so are not

generally affected. See additional discussion under Wetland/Riparian on the affect of sheep grazing on this resource.

2. Aquatic Invertebrates- In general, this group requires good water quality with a substrate that allows feeding, reproduction, and other essential processes. *Pyrgulopsis giulianii*, a spring snail, has been collected at springs and creeks along the base of the Sierra Nevada range (Hershler and Sada, 2002). Hershler (pers. Com., 2000) indicated that the spring snails require good water quality and a specific substrate to survive. Those riparian sites with a “not met” rating which are impacted by livestock trampling that creates shallow, muddy sites with poor water quality would not likely have the snails or other invertebrates. In the sheep allotments many scattered springs and seeps that could have supported small snail populations have been developed for human or wildlife use or have dried up because the aquifer has been drawn down. It is unlikely that the snails could return to these sites even with restoration. Bats, birds, and other wildlife that depend on insects for food have been impacted as well.

Threatened or Endangered Species:

1. Desert tortoise- The desert tortoise is a State and Federal Threatened species. Sheep grazing occurs in a mix of Category I, II, and III desert tortoise habitat, primarily Category III. Some Category I was allowed to be grazed under the 1994 Biological Opinion to create more discernible administrative boundaries. The Biological Opinion likewise did not preclude sheep grazing from the Category II tortoise habitat in the El Paso Mountains. Roughly 21,841 acres of Category II in the El Pasos is grazed as well as roughly 2,000- 3,000 acres of Category I south of the Randsburg- Mojave road. These 2,000- 3,000 acres are classified as Critical Habitat for the Desert Tortoise, as well. The remainder of sheep grazing occurs in Category III tortoise habitat, outside Critical Habitat.

The most recent information on the desert tortoise is found in the Desert Tortoise Recovery Plan Assessment Draft (Tracy, et al, 2004) and the Draft West Mojave Plan (U. S. Bureau of Land Management, 2003). Declines at the DTNA were as high as 90% (Berry, 2000), although some areas there retain relatively stable populations. One square mile on the west side of the DTNA, for example, was surveyed recently (2004), and the density will probably be over 60 tortoises per square mile. This part of the DTNA is well away from the heavy motorized vehicle use to the west, south, and east of the DTNA. Exact densities over the West Mojave are difficult to accurately assess, though may be in the neighborhood of 15- 20 adults per square mile in Category I Habitat. Keith et al (2005) came up with an estimate of from 0 to .9 tortoises per square kilometer, or less than 170 tortoises for the allotment. These were concentrated in two areas, an area near Red Rock State Park and another just east of Robbers Roost. A similar study is being proposed for the El Paso Range and surrounding flatlands as well as an area just south of Ridgecrest.

The recent tortoise study (Keith et al, 2005) was done on the Rudnick grazing allotment, primarily a cattle allotment, but with occasional sheep grazing. In this study, researchers compared tortoise densities with anthropogenic (human- related) impacts. About 4% of potential tortoise habitat on the Rudnick allotment was sampled using 1 hectare plots. Two concentrations of tortoises were found, with few sign elsewhere. With the low densities (<8.6/km²) however, they felt there could be tortoises between the two areas. They recorded less “livestock scat” in these two areas than elsewhere on the allotment but it’s not clear if this was entirely cattle or included sheep scat. It’s likely that cattle are having the primary impact but sheep should not be discounted.

Line- distance sampling efforts have been done in the Western Mojave Desert, in 2001, 2002 and more recent years. Density estimates can be made from the data if the encounter rates (the number of tortoises observed for each kilometer walked) are high enough. The 2002 survey (Chambers Group, 2002) done in the Rand Mountains/Fremont Valley Management Area encountered only 10 live tortoises for a low, weather related encounter rate of .045, too low for a statistical analysis on density. Similar surveys done in 2001 and 2002 for the Fremont/ Kramer Desert Wildlife Management Area (DWMA) had a higher encounter rate- .172 in 2001 but .096 in 2002. A density of from 18 to 33 tortoises per square mile was calculated for the Fremont/Kramer DWMA, the highest quality habitat.

A third method of acquiring density data is through the 60- day permanent study plot. These have been established across the desert, with some plots in the sheep and previous sheep- grazing areas. None of the plots are currently in sheep- grazing areas so it is difficult to estimate the affected tortoise population from these estimated plot densities.

It would be difficult to come up with a total number of tortoises for the area that might be affected by sheep grazing. Using the densities from the Rudnick study and a figure of almost 574,000 acres (2323 square kilometers) for sheep grazing, the population could range from 2,323 animals up to almost 20,000 animals. Using the mean from the Line Distance Sampling from 2002, 9.58/square kilometer, we would end up with a population of 21,487. It appears the upper limit would be 20,000 to 21,000 for the sheep- grazed areas, but these are for the best habitat- the DWMA areas. The non- DWMA areas, however, are generally exposed to a wide range of impacts so would tend to have lower densities, such as might be found in the Jawbone/ Butterbrecht ACEC. With recent trends in good production of annuals, we might see the numbers approaching the upper high end, but have no way to confirm this at this time.

The Desert Tortoise Recovery Plan attributed the declines to the cumulative impacts of human intervention, predation, habitat loss and degradation, and disease (USFWS, 1994). Tracy, et al (2004) cited excessive route proliferation as the key reason for the failure of tortoises to rebound elsewhere. Loss from the Upper Respiratory Tract Disease (URTD) was most likely exacerbated by extreme periods of drought over this same time period. Brown, et al (1999) suggests that the clinical expression of this disease may be cyclical, again perhaps related to weather patterns.

The information obtained from the Rangeland Health Assessments is useful in determining if the habitat meets the needs of the tortoise, but factors associated with vehicular use may overshadow impacts of sheep grazing. An area that “Met” the standards for Rangeland Health would likely be adequate habitat for the desert tortoise since factors assessed include the native annual composition, good shrub cover and diversity, and a general health of the plants present.

Though most scientists recognize that historical overgrazing has caused a deterioration of desert tortoise habitat, there have been no published studies to fully document the impacts of current livestock grazing on the California desert (Lovich et al. 1999). The current management of sheep grazing has not been evaluated over the long term regarding impacts to desert tortoises. Short term studies and observations have identified potential conflicts, and in many cases the management of sheep grazing has been modified to reduce these impacts. Impacts are mainly to the soil (increased compaction and disturbance of biological crusts), to the vegetation (removal of biomass), and, to a much less extent, to small tortoises and burrows (Lovich, et al., 1999). Many of these modifications to the way sheep are grazed were in the Biological Opinion and appear in the Appendix A. “Terms and Conditions”.

The following table presents acres of tortoise habitat on public land in the sheep allotments. Numbers are estimates from GIS maps.

Ridgecrest Allotments	Acres of Category I tortoise habitat	Acres of Category II tortoise habitat	Acres of Category III tortoise habitat	Acres of Critical Habitat
Antelope Valley	0	0	1,048	0
Bissell	0	0	5,596	0
Boron	0	0	10,868	0
Cantil Common	114,000 (< 3,000 acres grazed)	22,000	220,000	78,035 (about 3000 grazed)
Lava Mtn	9,000	0	12,000	2,146
Monolith Cantil	29,846 (Not grazed)	0	8,000	29,846
Spangler Hills	0	0	54,143	0
Warren	0	0	0	0
Hansen	0	0	<6,000	0
Rudnick	0	0	150,000	0
Walker Pass	0	0	60,000-70,000	0
Totals	152,846 (12,000 grazed)	22,000	540,000	110,027 (3,000 grazed)

2. *Mohave ground squirrel (MGS)* - This species is a California State Listed Species and receives protection under the California Endangered Species Act. MGS records are from the same vegetation communities that domestic sheep use. The allotments are almost entirely covered with MGS habitat. The following table shows that the MGS “is a generalist in terms of plant community preference; it is neither restricted to nor concentrated within any of the 16 plant communities where it has been reported: its occurrence is directly proportional to the occurrence of plant communities (U. S. BLM, 2003).”

Plant Community	No. and Percent Occurrence of MGS	% Occurrence of Community with MGS Range
Mojave creosote bush scrub	136 (53.96%)	53.97
Desert saltbush scrub	50 (19.84%)	19.84
Mojave mixed woody scrub	22 (8.73%)	8.79
Urban	15 (5.95%)	5.95
Agriculture	9 (3.57%)	3.57
Other types	20 (7.87%)	7.96
Totals	252 (100%)	100

MGS populations follow a “boom and bust” cycle; they expand into habitats when conditions are favorable and shrink back into core areas when conditions are less favorable, particularly when conditions such as drought occur over several years (U.S. BLM, 2003). Leitner (1998) found that the population fluctuates drastically with rainfall, reflecting reproduction. In years with poor winter rainfall, no reproduction occurred. It is important that the vegetation communities forming the “core” remain in excellent condition, but also those areas that the squirrel would expand back into must be maintained in good health. Leitner and Leitner (1996) demonstrated an overlap in the diet of domestic sheep and MGS, so any grazing system must allow sufficient forage for the squirrels, both shrub species and annual plants. Shrubs are also important for cover. Utilization of shrubs should remain low enough to maintain or increase the total vegetative cover. The table showing acres of desert tortoise habitat also corresponds to MGS habitat, although MGS tend to do better at higher elevations than do tortoises.

b. Environmental Consequences

1. Impacts of the Current Management

Special Status Species (Non-listed)

Direct and Indirect Impacts: Direct and indirect impacts to wildlife species from the proposed action would occur on over 500,000 acres of desert wildlife habitat. The major indirect impact would be the grazing of annuals, some of which are used by wildlife for food and cover. Some of these wildlife species are, in turn, fed upon by eagles and other predators. There would be impacts from grazing shrubs at bedding sites and elsewhere when annuals have dried up or have been grazed down.

Densities of certain small mammal species (Merriam's kangaroo rats, southern grasshopper mice, and long-tailed pocket mice) were higher in ungrazed areas than in grazed (Brooks, 1992). A number of species, though, were similar in densities, and jackrabbits actually were more abundant in grazed areas. Indirect impacts would be minimal as long as the protocols developed under the Biological Opinion are strictly followed.

Sheep would directly impact wildlife by trampling burrows and ground nests of birds. Dogs used by the sheep herders may harass a number of species.

As long as sheep are grazed according to protocols established under the Biological Opinion, impacts would be local and minor. Each grazing year, BLM has found a small percentage of sheep grazing to be in non-compliance and normally has taken immediate action to bring the rancher into compliance. This non-compliance can result in the annual vegetation being grazed to leave less than the pounds per acre of forage required. Shrubs also may have been grazed to where the plant's physiology is affected. The percentage of 500,000+ acres that is grazed in non-compliance is small, but the impacts could be significant if done every grazing season. All of the reptiles, birds, and mammals listed in the table, as well as those discussed in the Affected Environment, could be affected, mainly indirectly through habitat impacts.

Threatened and Endangered Species

Direct and Indirect Impacts: Direct and Indirect impacts to from 2000 to 20,000 tortoises would occur on about 21,800 acres of Category II Tortoise Habitat and 12,000 acres of Category I habitat. Slightly over 500,000 acres of category III habitat would likewise be affected. Since the Terms and Conditions in the Appendix will be followed, this action will not jeopardize the existence of the species. The Terms and Conditions have reduced the impacts to a low level.

The potential for trampling small tortoises still exists, although the small ones are out of the burrows early in the spring before sheep or the adult tortoises become active. The little ones will emerge in the spring however, if weather and vegetation permit. The spread-out grazing required would reduce the chance of trampling, as well as reduce impacts to burrows. The USFWS has determined that eight (8) tortoises may be killed or injured as a result of sheep grazing, with the young tortoises the most likely victims. (Due to their small size, it's unlikely they would be found even if killed, however.) The direct impacts to the overall population are minimal due to a couple of factors. One is that impacts are mainly to young, small animals, whereas the adults are the key to maintaining a stable population. Enforcing compliance of prescriptions such as

grazing sheep in a loose, open, manner will improve the chances that more small tortoises will enter into the adult cohort. This will be important in maintaining genetic diversity. The impacts to the population overall are further reduced by the fact that the highest quality habitat (Category I) is not grazed. Ravens and other animals may be attracted to sheep camps because of food and water. These predators are a threat to young desert tortoises.

The indirect impacts have the most potential to affect the tortoise population. Impacts to soil and vegetation, important to tortoises, are reduced by the Terms and Conditions. There would continue to be disturbance to the biological soil crust. It is unknown if the crust would rebuild over the long term with continued grazing. Impacts to soil and vegetation will be greatest at bedding areas. Sheep do consume forage that is also needed by tortoises, but the sheep turnout is usually after tortoises (especially young) have emerged and have begun eating.

Impacts to the Mohave ground squirrel would be minimal under the Proposed Action with the Terms and Conditions in place. These impacts would be indirect, in the form of grazing annual plants and shrubs that are important to MGS. The highest MGS populations have actually been found at higher elevations, outside of the sheep- grazing areas. Grazing of shrubs by sheep could affect the MGS because of the reliance on certain shrub species for food. Under proper grazing practices impacts on shrubs would occur primarily at bedding areas, and would generally not occur on Public land because sheep would be removed before annuals (their preferred food) disappeared.

Recommended Mitigation:

Much of the mitigation for the desert tortoise (See Terms and Conditions) would be applicable for other desert wildlife. It is extremely important that BLM field personnel ensure compliance with the Terms and Conditions (Mitigation). It is also important to ensure that each herder knows the rules.

Residual:

Species diversity would be somewhat less in the grazed areas, and total biomass would also be slightly less. The number of species should remain similar between grazed and un-grazed areas except that those species that are more susceptible to grazing impacts would be less abundant.

Cumulative Impacts:

Within the areas grazed by sheep, other activities such as OHV use, mining, and fire, along with natural events would continue to impact these species and their habitats. More intense management of these activities under the Desert Plan has reduced the cumulative impacts in the areas to be grazed. In the reasonably foreseeable future, motorized recreation can be expected to increase and continue to impact the desert. Mining activity is likely to continue but is localized and can be mitigated on site. The West Mojave Plan has a number of proposals to minimize impacts from all activities, but at this time it is unknown what management actions will be carried forward. Data from the DTNA 60 day study plots suggests that cumulative impacts from all these activities would continue to slow down the recovery of desert tortoises. MGS populations would bounce back much more quickly.

Irreversible and Irretrievable Resources:

This action is a continuation of an activity which has been going on for a hundred years, but only in the last 25 or so years has this activity been managed under the CDCA Plan. It has been demonstrated at the DTNA and elsewhere that the desert- scrub community can redevelop a significant native annual plant component if rested from grazing. With the existing Terms and

Conditions of the Biological Opinion in place, no irreversible or irretrievable loss of resources is expected to occur.

2. Impacts of the Proposed Action

Impacts will be the same as Current Management except for the following difference. The BLM will designate, in coordination with sheep operators, where watering and bedding sites for sheep bands may be located prior to authorizing grazing in the ARHD of the Cantil Allotment. However, watering and bedding sites will be selected based on archaeological resources, not on wildlife considerations. Therefore, impacts to wildlife are not expected to be different from those caused by current management unless sheep are kept away from certain springs that may be close to archaeological resources. In this case, the impacts to riparian vegetation and wildlife in the vicinity of the spring would be diminished.

Recommended Mitigation: Same as for Current Management

Residual: Same as for Current Management

Cumulative Impacts: Same as for Current Management

Irreversible and Irretrievable Resources: Same as for Current Management

3. Impacts of No Grazing

Direct and Indirect Impacts:

With no grazing, there may be an increase in small mammals and birds, especially with respect to 3 species: the Miriam's kangaroo rat, southern grasshopper, and long-tailed pocket mouse. An indirect impact might be an increase in predators, including golden eagles. There would be slightly higher numbers of desert tortoises overall. This would result primarily from the elimination of trampling of hatchlings and impacts associated with bedding areas, as well as an increase in annual forb availability. This difference may not be detectable using current methodologies. By managing other factors such as raven predation, OHV activity, collection, and urban development, tortoise numbers would return to pre-drought levels.

Irreversible and Irretrievable Resources:

The vegetative community would develop in response to climatological factors and the presence of exotic species already in the system. Recovery of the vegetation would continue to provide habitat for wildlife and stimulate diversity. Tortoise habitat would approach a native condition; though not reach a 100% level. Exotic plants are established and will remain at some level, although tortoises have demonstrated that they can deal with habitat that is not entirely native species.

Residual:

There would be a trend toward a native plant and animal community, but probably never achieve it. The non-native species are fairly well established and are likely to persist even under a non-grazing regime. The resultant habitat from this alternative would provide an optimum opportunity for the tortoise and Mohave ground squirrel populations to increase.

Cumulative Impacts:

With OHV, mining, and other activities, data from the DTNA 60 day study plots suggests that tortoise densities will continue to be slow to recover, even in non- grazed habitat. MGS populations would bounce back much more quickly. The West Mojave Plan could provide additional management for the other activities, in which case the No Action Alternative could result in a much higher recovery rate of the tortoise. OHV and other activities would still impact tortoises within areas that would have had grazing.

Recommended Mitigation:

Proposed mitigation would be provided for all types of projects within the allotments whenever they may affect a tortoise or Mohave ground squirrel. Mitigation will vary with the type of project and would be site specific. See previous BLM NEPA documents for examples.

c. References

Listed at the end of the document

U. VEGETATION

a. Affected Environment

General:

The project area is located at the western edge of the Desert Floristic Province as described in the *Jepson Manual, Higher Plants of California*. It is adjacent to the California Floristic Province and the Great Basin Floristic Province. This has resulted in components from both these provinces occurring in the area. Sawyer and Keeler-Wolf in *A Manual of California Vegetation* describe the vegetation as Series (communities) dominated by shrubs. The vegetation in the study area is typical for the western Mojave Desert with one major exception. Prevailing westerly winds along the western edge of the Mojave Desert block most summer rainfall. This results in a cool-season vegetation complex lacking warm-season plant species that are common farther east. These sheep allotments are totally within the cool-season plant zone.

The historical vegetation for the region has changed greatly over the last 10,000 years. Ten thousand years ago, the region was coming out of the Ice Age. Conifer forests covered most of the region and large lakes existed in the Indian Wells and Searles Valleys. Since then the climate has gotten much warmer and drier and the original vegetation has retreated over 3,000 feet up the mountains. In the place of the original vegetation is a whole new set of plant communities that are adapted to the new climate have arrived. As an example, the creosote bush (*Larrea tridentata*) which is now the dominant plant species in the region, spread into the region from the southeast arriving in the Indian Wells Valley area only 7,000 years ago. As a result, the current plant communities in the sheep allotments consist primarily of species that are relatively new to the region and quite dynamic.

The creosote bush Series is the most prevalent vegetation Series in the study area. In addition the Creosote bush Series dominated the vegetation in all of the allotments. Common perennial species found in the Creosote bush Series include Creosote bush, Burro-bush or Bursage (*Ambrosia dumosa*), Winterfat (*Ceratoides lanata*), Spiny Hop-Sage (*Grayia spinosa*), Desert needlegrass (*Achnatherum (Stipe) speciosa*), Indian ricegrass (*Achnatherum (Oryzopsis) hymenoides*) and Varied bluegrass (*Poa secunda*).

The Joshua tree (*Yucca brevifolia*) Series is also found through the study area in all of the allotments. This Series is similar to the Creosote Series with the inclusion of emergent Joshua trees. This series typically occurs at the upper edge of the Creosote bush Series where there is more moisture.

The Mixed Saltbush Series occurs primarily in the Monolith Cantil Allotment. Mojave salt bush (*Atriplex spinifera*) is the principal species over a large portion of the allotment where poor drainage is prevalent.

A common thread to all of the vegetation series is the occurrence of a diverse groundcover of annual plants. This ephemeral production is the principal basis for the sheep grazing in the desert. The annual (ephemeral) vegetation is extremely variable in biomass production, groundcover and species composition year to year and site to site. Biomass production is zero in poor years, but can exceed 4000 pounds per acre at the better sites in a good year. More common biomass productions will range between 500 and 1000 pounds per acre. Species composition is tied to germinating conditions. Over 500 species of annual plants occur in the area. Of these, only a few dozen species are of sufficient numbers and production to be important to livestock. These include storks bill or filaree (*Erodium cicutarium*), coreopsis (*Coreopsis bigelovii*), fiddleneck (*Amsinkia spp.*), phacelia (*Phacelia fremontii* and *tanacetifolia*), yellow comet (*Mentzelia spp.*), goldfields (*Lasthenia (chrysostoma) californica*), desert dandelion (*Malacothrix californica*), bottle washer (*Camissonia spp.*), Fremont pincushion (*Chaenactis fremontii*), gillia (*Gillia spp.*), for-get-me-not (*Cryptantha spp.*), desert candle (*Caulanthus inflatus*), desert trumpet, (*Eriogonum inflatum*), mustard (*Brassica spp.*), little golden poppy (*Eschscholtzia minutiflora*), California poppy (*Eschscholtzia californica*), Arabian grass (*Schismus aribicus*), cheat grass (*Bromus tectorum*) and red brome (*Bromus (rubens) madritensis Ssp. rubens*) The annual grasses (mostly introduced) will germinate under much cooler conditions than the broad-leaved forbs. Many of the forbs are showy wildflowers. A number of sites in the mountains provide sheltered warmer sites which consistently provide the warm moist conditions necessary for wildflower germination. A number of weedy annual species favor warm-season conditions. This results in some species being absent, others restricted to roadsides and other water concentration areas. Others species become less dominate in the cool-season climate.

b. Environmental Consequences

1. Impacts of Current Management

Direct and Indirect Impacts:

Vegetation (General): Livestock grazing impacts vegetation through removal by grazing and by trampling. Sheep are selective grazers and in the early part of the grazing season their diet will consist primarily of annual (ephemeral) vegetation. Later in the season when the annuals dry up, the sheep will shift part of their use to browse (brush) species such as Spiny hop-sage. The sheep make little use on the bunch grasses such as Indian ricegrass and Desert needlegrass. When the sheep are spread out and moving, the sheep typically skim the vegetation and the consumption rates are difficult to measure as they seem to use less than the site to site variability. The stipulations require that they leave 350 pounds per acre and only consume 5% of the production above 350 pounds per acre in category I and II tortoise habitat. In addition areas in category III tortoise habitat, 200 pounds per acre would be left. At these grazing rates, there

would be a considerable standing biomass of annuals left for soil protection and seed production. This is also adequate cover to carry wildfires through these shrub dominated plant series.

Intense use sites such as watering, corralling and shipping sites could have trampling impacts sufficient to damage all standing biomass including both annuals and perennials. It is expected that up to 750 acres could be impacted by intense uses. Watering sites constitute nearly 700 acres of this use. Watering sites are normally set up in roads which are already heavily impacted reducing the actual area impacted well below the 700 acres. Several corral sites have been used for 60 years or more every year there have been sheep in the area. These sites once had permanent corrals which have since been stolen. On these sites, the vegetation has been converted to annuals. At these corrals, it is expected that continued use would not result in any additional long term changes in vegetation.

Irreversible and Irretrievable commitment of Resources:

The vegetation removed by grazing is renewable on a sustained basis. Heavy use sites would revegetate once the impacting uses are removed. The introduction of exotic species, especially noxious weeds is very difficult if not impossible to reverse. Some of the noxious weeds have the potential to totally dominate a site.

Residual:

There would be continued utilization of renewable vegetation resources.

Cumulative Impacts:

Continuing sheep grazing would constitute the continuation of a use at a level 10% of its historic level 50 years ago with a number of environmental safeguards that did not exist 25 years ago. OHV racing is the other use in the area which impacts extensive areas. It, also, has declined over 50% in the last 10 years.

Recommended Mitigation:

None

Special Status Plants: Monitor the special status plant populations for adverse impacts. Possibly restrict grazing use from the known sites where desert cymopterus occurs.

2. Impacts of Proposed Action

Direct and Indirect Impacts:

Same as Current Management

Irreversible and Irretrievable Commitment of Resources

Same as Current Management

Residual Impacts

Same as Current Management

Cumulative Impacts

Same as Current Management

Recommended Mitigation

Same as Current Management

3. Impacts of No Grazing

Direct and Indirect Impacts:

No annual or perennial vegetation would be trampled or removed by sheep. There would not be any expected changes in vegetation composition on an overall basis. Some high impact type sites may increase their perennial cover. Standing Biomass levels could increase. Additional biomass could increase the incidence and/or intensity of fire.

Special Status Plants: No special status plants will be impacted by this alternative.

Irreversible and Irretrievable commitment of Resources:

With no grazing there would be no use of vegetation.

Residual:

The same as Direct and Indirect Impacts

Cumulative Impacts:

OHV use would continue to impact vegetation in some areas.

Recommended Mitigation:

None

C. References

Listed at the end of the document

CHAPTER 4:

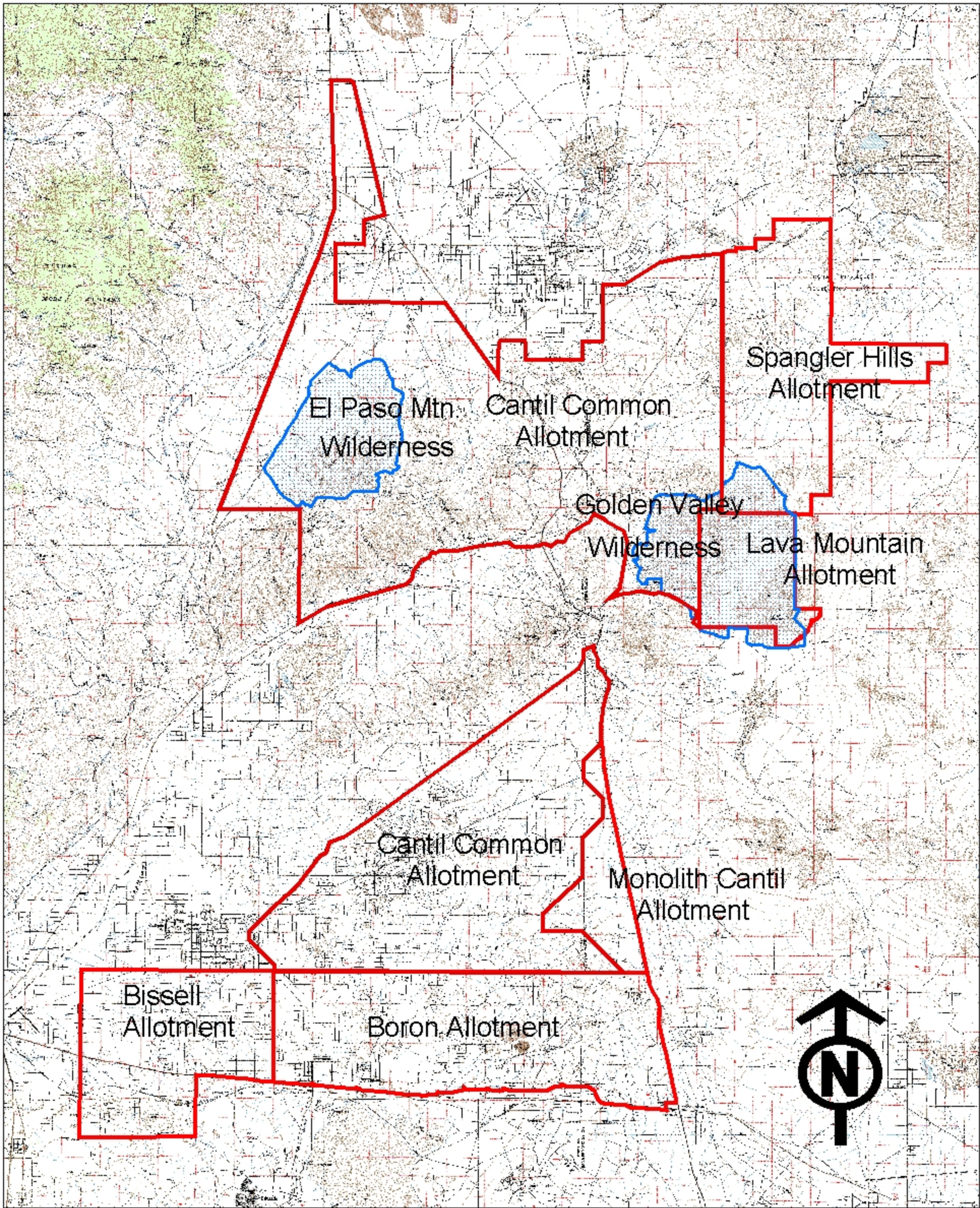
PARTICIPATING STAFF:

Lead Writer:	<u>Sam T. Fitton</u>	<u>Botanist</u>
	Name	Title

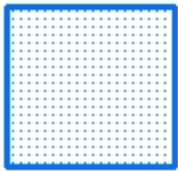
<u>Participating Staff</u>	<u>Resource Specialty</u>
Donald Storm	Archeologist
Glen Harris	Soil, Air, and Water, Vegetation, Special Status Plants and Weeds
Bob Parker	Wildlife Biologist
Martha Dickes	Wilderness Specialist
Craig Beck	Recreation Specialist
Dave Sjaastad	Rangeland Management Specialist
Peter Graves	Environmental Coordinator
David Sjaastad	Resources Branch Chief

APPENDIX 1
ALLOTMENT MAPS

Primary Sheep Allotments

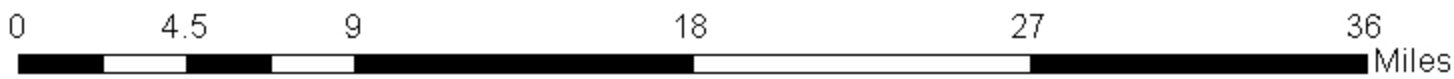


Allotment Boundaries

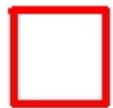
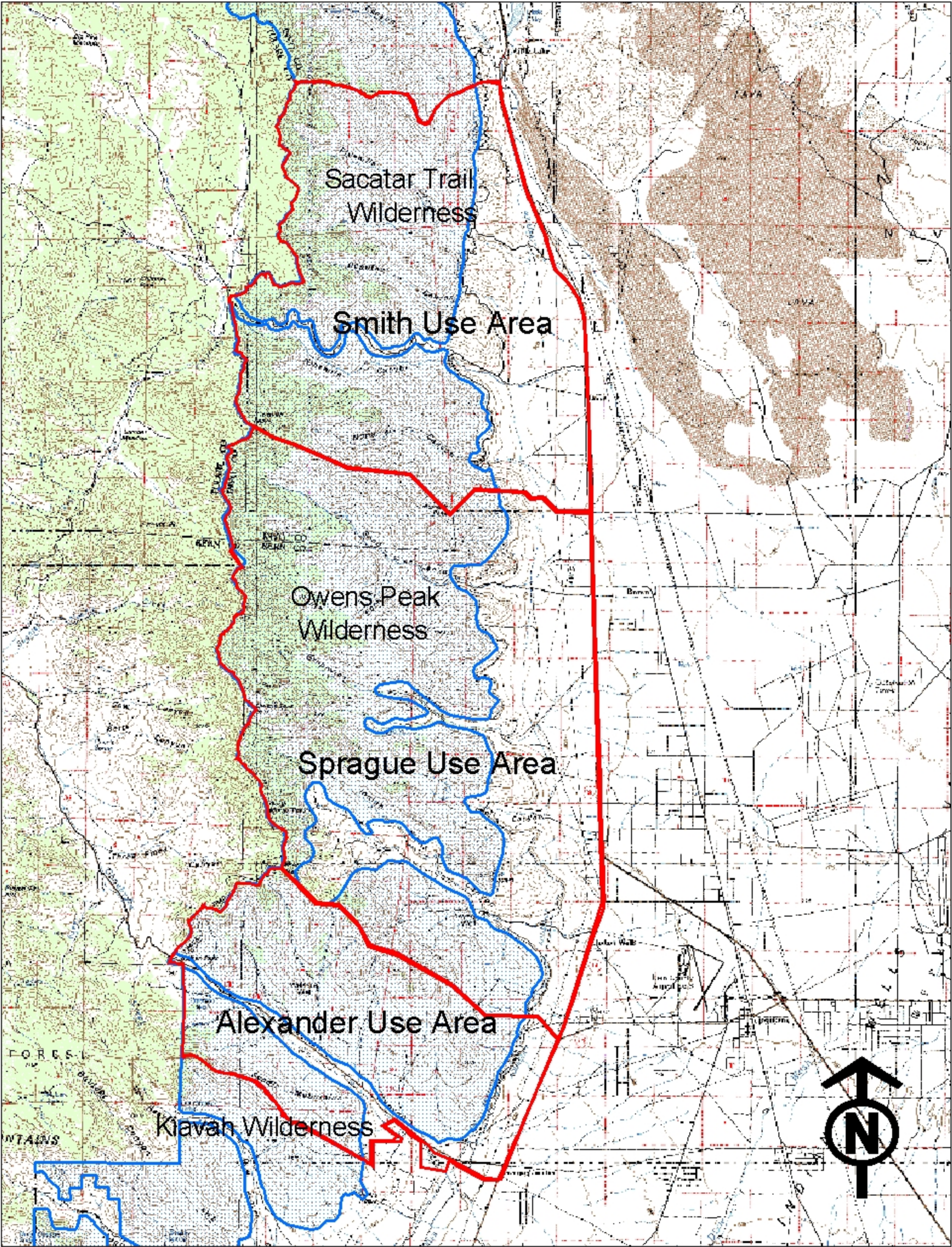


Wilderness
Boundaries

1:325,000



Walker Pass Common Allotment: Cattle & Sheep

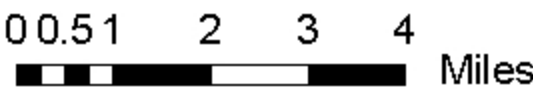


Allotment & Use Area Boundaries



Wilderness Areas

1:125,000



APPENDIX 2
FORAGE SPECIES
PROPER USE FACTORS

APPENDIX 2
PROPER USE FACTORS FOR FORAGE SPECIES
IN THE RIDGECREST FIELD OFFICE AREA

Proper Use Factors (P.U.F.'s) are related as a percentage of plant that is allowed to be grazed. Usually an average is taken from sampling a local population at a site.

PLANT- SCIENTIFIC NAME	COMMON NAME	P.U.F.
TREES & SHRUBS		
<i>Acamptopappus sphaerocephalus</i>	Goldenhead	10
<i>Ambrosia dumosa</i>	Burrobush	10
<i>Artemesia spinescens</i>	Budsage	20
<i>Artemesia tridentata</i>	Great Basin Sage	<5
<i>Atriplex canescens</i>	Four-wing Saltbush	40
<i>Atriplex confertifolia</i>	Shadscale	10
<i>Atriplex hymenelytra</i>	Desert Holly	<5
<i>Atriplex polycarpa</i>	Cattle Spinach	20
<i>Chrysothamnus nauseosa</i>	Rubber Rabbit Brush	<5
<i>Chrysothamnus viscidiflorus</i>	Green Rabbit Brush	<5
<i>Coleogyne ramosissima</i>	Blackbrush	<5
<i>Encelia farinosa</i>	Brittlebrush	<5
<i>Ephedra nevadensis</i>	Nevada joint fir, Mormon Tea	30
<i>Ephedra viridis</i>	Mountain joint fir	20
<i>Ericameria cooperi</i>	Goldenbush	0
<i>Ericameria linearifolius</i>	Linear-leaved Goldenbush	<5
<i>Eriogonum fasciculatum</i>	California buckwheat	20
<i>Eriogonum wrightii</i>	Wright's buckwheat	40
<i>Grayia spinosa</i>	Spiny Hopsage	30

<i>Gutierrezia sarothrae</i>	Snakeweed	0
<i>Hymenoclea salsola</i>	Cheesebush	<5
<i>Isomeris arborea</i>	Bladder-pod	10
<i>Juniperus californica</i>	California Juniper	0
<i>Juniperus occidentalis</i>	Western Juniper	0
<i>Juniperus osteosperma</i>	Utah Juniper	0
<i>Krascheninnikovia lanata</i>	Winter Fat	40
<i>Larrea tridentate</i>	Creosote bush	0
<i>Lepidium fremontii</i>	Desert Alyssum	<5
<i>Lepidospartum squamatum</i>	Scale-broom	<5
<i>Lycium andersonii</i>	Anderson thornbush	10
<i>Lycium cooperi</i>	Peach thornbush	10
<i>Machaeranthera tortifolia</i>	Desert aster	20
<i>Menodora spinescens</i>	Spiny menodora	20
<i>Opuntia basilaris</i>	Beavertail cactus	0
<i>Psoralea arguta</i>	Indigo brush	10
<i>Salazaria mexicana</i>	Paperbag bush	10
<i>Salix lavaegata</i>	Red Willow	10
<i>Salvia dorii</i>	Purple Sage	10
<i>Senna armata</i>	Desert cassia	<5
<i>Stephanomeria pauciflora</i>	Desert Straw	30
<i>Tetradymia spinosa</i> var. <i>longispina</i>	Cotton felt-thorn	0
<i>Yucca brevifolia</i>	Joshua tree	<5

FORBS

<i>Mirabilis bigelovii</i>	Wishbone bush	40
----------------------------	---------------	----

<i>Sphaeralcea ambigua</i>	Desert Mallow	40
----------------------------	---------------	----

GRASSES

<i>Achnatherum hymenoides</i>	Indian Rice Grass	50
<i>Achnatherum speciosa</i>	Desert Needlegrass	50
<i>Distichilis spicata</i>	Saltgrass	30
<i>Erioneuron pulchellum</i>	Fluffgrass	20
<i>Hilaria jamesii</i>	Galleta grass	50
<i>Poa scabrella</i>	Pine bluegrass	50
<i>Sitanion hystrix</i>	Squirrel-tail	40
<i>Sporobolus airoides</i>	Alkali Sacaton	40

References:

1. Appendix XIII, Volume F of Final Environmental Impact Statement and Proposed Plan for the California Desert Conservation Area, Sept. 1980
2. Plant Checklist for BLM Ridgecrest, CA Field Office Area, 2006

APPENDIX 3
RANGE IMPROVEMENTS

Appendix 3: Range Improvements Cantil Common Allotment

Project Name/No.	Location	Condition & Comments	Mitigation description
5004-Sheep Spring & Storage	T28S, R39E, S17	Functional	
5201-Last Chance Well	T28S, R38E, S33	Not Functional- CCC constr.	
5203-Fuller Well, Windmill & Storage	T28S, R40E, S32	Not Functional	
5204-Cornwine or Searles Well	T28S, R40E, S22	Not Functional- CCC constr.	
5205-Adams Well	T28S, R40E, S29	Not Functional- CCC constr.	
5206-Mansfield Well	T28S, R40E, S31	Not Functional-	
5212-Black Hills Well	T28S, R38E, S18	Not Functional	
5216-Inyo Well	T27S, R39E, S7	capped	
5217-Searles or Cornwine Well #2	T28S, R40E, S22	Not Functional	
5224-Willow Spring Well	T28S, R40E, S20	Not Functional	
5275-Inyo Storage	T27S, R39E, S7	Not Functional	
5277-Last Chance Storage	T28S, R38E, S33	Functional- CCC Construction	
5362- Inyo Pipeline & Trough	T27S, R39E, S7	Not Functional- CCC constr,	
5594-Atolia Holding Corral	T30S, R41E, S30	Not functional	
5598-Black Hills Corral	T27S, R38E, S27	Not functional	
5080-Laurel Mtn. Spring and Storage	unknown		
5225-Rinaldi's Well	T28S, R39E, S19		
5239-Black Hill's Well Solar Project	T28S, R38E, S28		
5246-SW Area Groundwater Monitoring Well #2	Unknown		
5249-SW Area Groundwater Monitoring Well			
5362			

APPENDIX 4
WILDLIFE TABLES

	Common Name	Habitat	Legal Status	Notes on Surveys and Monitoring
<i>Gopherus aggasii</i>	desert tortoise	river washes, rocky hillsides, and flat desert having sandy or gravelly soil. Creosote bush (<i>Larrea tridentata</i>), burrobush (<i>Ambrosia dumosa</i>), saltbush (<i>Atriplex</i> spp.), Joshua tree (<i>Yucca brevifolia</i>), and cacti; diverse grasses and forbs essential as food sources, to 4,000 feet elevation	FT ST	Records throughout the proposed sheep-grazing area, up to 4,000 feet, including Kelso Valley on west side of the Jawbone/ Butterbrecht ACEC. Recent monitoring efforts include Study Plot surveys at 3 separate sites at DTNA and one at Fremont Valley. Line Distance sampling in the Rends and a separate effort throughout west Mojave for two consecutive years. BLM transects in the Rends in 2004. One hectare plot surveys in 2002, 2003, and 2004 in the Jawbone Butterbrecht ACEC. Additional study in Rands on health of tortoises.
<i>Anniella pulchra</i> spp. <i>pulchra</i> and spp. <i>nigra</i>	California legless lizard	sparsely vegetated woodland, sandy loam soils of stabilized dunes, and undisturbed desert scrub at the western edge of the Mojave Desert	CA species of concern	Occurs in the western Mojave Desert in the Antelope Valley and individual found in Jawbone Butterbrecht ACEC.
<i>Circus cyaneus</i>	northern harrier	Migrant and wintering birds use upland habitats with low vegetation (saltbush or creosote scrub), but wintering birds tend to concentrate in agricultural fields.	CA species of special concern 2	Fairly common migrant and uncommon winter resident.
<i>Accipiter striatus</i>	sharp-shinned hawk	Does not breed in sheep- grazed areas. During migration and in the winter occurs most habitats except bare areas, preferring montane forest, Joshua tree woodland, and riparian areas.	CA species of special concern 3	Uncommon migrant and winter resident.
<i>Accipiter cooperi</i>	Cooper's hawk	Breeding occurs in open montane forests, riparian woodlands, and desert oases.	CA species of special concern 3	Small numbers of migrants may supplement year-round resident birds.
<i>Buteo swainsoni</i>	Swainson's hawk	riparian woodland or sparse savannah with tall (usually > 40 feet) oak, cottonwood, walnut, and / or large willow for nesting and adjacent open land such as native grasslands, cereal or alfalfa fields for foraging	ST	Records in Kelso Valley inside the Jawbone/Butterbrecht ACEC; potential foraging habitat across the entire ACEC, no records of nesting within the sheep allotments.

<i>Buteo regalis</i>	ferruginous hawk	winter habitats are native grasslands and shrub-steppes; human-dominated habitats include pastures and fallow cropland with abundant rodents.	BLM species of concern, CA species of special concern 3	Occurs as a winter visitor or migrant and most numerous in weedy grasslands and agricultural regions.
<i>Aquila chrysaetos</i>	golden eagle	remote cliff ledges in mountains for nesting; forages widely across all habitats in the Mojave Desert landscape but prefers rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops	BLM sensitive species, CA species of special concern 3	Frequent records during the breeding season, likely nesting areas in the El Pasos and the Sierra range.
<i>Falco mexicanus</i>	prairie falcon	sheltered cliff ledges, bluffs, or rock outcrops for nesting; perennial desert grasslands and desert shrub lands in the Jawbone-Butterbrecht ACEC, the Rand Mountains, Fremont Valley and elsewhere in the Ridgecrest FO	BLM sensitive species, CA species of special concern 3	Widespread but uncommon at all seasons. Robber's Roost, located in the north part of the Jawbone/Butterbrecht ACEC has had up to two pair of nesting falcons (Parker, 1993). Axelsson (2000) reported an active prairie falcon aerie in the western part of the ACEC. Historical surveys on file at the Ridgecrest FO.
<i>Athene cunicularia</i>	burrowing owl	open, dry desert grass- and shrubland and in grass, forb and open shrub stages of pinyon-juniper woodland for foraging; nesting and roosting in ground squirrel or other rodent burrows	BLM sensitive species, CA species of special concern 2	Widespread winter migrants to the Ridgecrest FO area supplement resident birds. Breeding pairs are widely scattered across the area to be grazed by sheep.
<i>Asio otus</i>	long-eared owl	Both breeding and winter habitats often consist of extensive cottonwoods and willows, as well as plantings of exotic species, including tamarisk	CA species of special concern 2	Nesting recorded in the riparian areas of the Rudnick allotment. Less likely to nest in areas used by sheep.
<i>Lanius ludovicianus</i>	loggerhead shrike	Foraging may occur in all habitats, especially those with open terrain and well-spaced lookout posts. Breeding requires patches of dense vegetation to hide nests.	USFWS Species of concern, CA species of special concern - addition	Winter migrants augment the resident population in the area to be grazed by sheep

<i>Toxostoma redivivum</i>	California thrasher	Chaparral shrublands and (locally) Mojave Desert shrublands	BLM Ridgecrest species of concern	Found at the northern limit of its range on the eastside of the Sierra Nevada. Not likely to be in the area to be grazed by sheep
<i>Toxostoma lecontei</i>	LeConte's thrasher	desert washes and flats with scattered shrubs, cacti, and a few small trees, including Joshua trees, plus large areas of open, sandy, or alkaline terrain	BLM sensitive species, CA species of special concern 3	Many records in the area to be grazed by sheep.
<i>Dendroica petechia</i>	yellow warbler	Nests in riparian forest and woodland with cottonwood and willows	CA species of special concern 2	Often hundreds of yellow warblers migrate daily through Butterbrecht Canyon in the spring, with smaller numbers in the fall. Nests at the nearby Kern River Preserve (500 pairs found in 1997) and canyons in the East Sierra, like Sand Canyon. Not significantly affected by sheep grazing.
<i>Icteria virens</i>	yellow-breasted chat	Nests in riparian forest and woodland with cottonwood and willows. During migration, the species may appear in all vegetation types.	CA species of special concern 2	Nests nearby in the Kern River Preserve (between 50 and 100 pairs annually). Not likely to occur within the sheep allotments.
<i>Spermophilus mohavensis</i>	Mohave ground squirrel	a diverse mix of shrubs, forbs, and grasses with canopies dominated by creosote (<i>Larrea divaricata</i>), <i>Atriplex</i> sp, or Joshua tree (<i>Yucca brevifolia</i>) woodland, important food sources are winterfat (<i>Krascheninnikovia lanata</i>) and spiny hopsage (<i>Grayia spinosa</i>): 2,200 to 4,900 feet at (Laabs and Alaback 1991, Leitner 2000)	ST	Trapping records for many areas within the sheep allotment

<i>Perognathus xanthonotus</i>	yellow-eared pocket mouse	found in Joshua tree and pinyon-juniper woodlands, desert shrubland, montane chaparral and sagebrush, and bunchgrass lands between 3,380 and 5,300 feet elevation; know from 6 locales in a limited range between Kelso Valley to Sand Canyon on the interface between the Sierra Nevada and Mojave Desert; habitat and meteorological requirements for breeding are not known (Laabs, West Mojave Species Accounts, 1997)	BLM sensitive species	Records from the east slopes of the Sierras and Kelso Valley, borderline areas of sheep grazing.
<i>Macrotus californicus</i>	California leaf-nosed bat	sedentary, non-hibernating; roosting and raising young in caves and abandoned mines with geothermal heating; range and behavior poorly known	BLM sensitive, CA species of special concern 2	No known records from the sheep allotments. May not depend on riparian habitat.
<i>Euderma maculatum</i>	spotted bat	roosts in cliff crevices, habits and habitat preferences not well described; not a colonial species; seasonal migrations elevationally; foraging areas may be 20 miles or more away from roost; diet consists almost entirely of moths	BLM sensitive, CA species of special concern - addition	Very rare: records from Red Rock Canyon State Park only. Potential foraging habitat in riparian habitat and shrub habitat so could forage within sheep allotment.
<i>Antrozous pallidus</i>	pallid bat	roost in rock crevices, tree cavities, buildings, bridges, and occasionally caves and mines in arid regions; colonial intra- and inter-specifically; food mostly flightless arthropods but may eat lizards, rodents, and even other bats	BLM sensitive, CA species of special concern - addition	Unknown if occurs in sheep allotment area but potential foraging area in riparian habitat and

<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	forages in arid grasslands and deserts but ranges also into high-elevation forests and meadows; roosting occurs in limestone caves, lava tubes, mine tunnels, buildings, and other human-made structures; hibernates in cool caverns or mines; maternity colonies in warmer portions of caves; non-migratory; feeds on moths; location of preferred habitats in the Mojave Desert poorly known	BLM sensitive, CA species of concern 2	Records from mines within sheep allotments, Rademacher hills, other sites. prone to disturbance - large colonies of female bats may abandon maternity sites after a single visit by people can cause the bats to abandon a roost.
<i>Ovis canadensis ssp. nelsonii</i>	Desert bighorn sheep	Open, steep, rocky terrain above the desert floor		Present in the ranges bordering the sheep allotments but not overlapping the sheep range. There are records of die-offs when domestic sheep interact with wild sheep from disease transmission. For this reason BLM established guidelines for minimum distances between domestic sheep grazing and wild sheep habitat.

APPENDIX 5

SHEEP GRAZING: TERMS AND CONDITIONS

APPENDIX 5

Existing Terms and Conditions

1. Turnout of sheep in Category I and II habitat shall not be permitted until after March 20. Turnout in Category I and II habitat shall not occur until 350 pounds (air-dry-weight) per acre of ephemeral forage is available. The Permittee/Lessee shall be required to remove the sheep from the area or the entire allotment if production falls below 350 pounds per acre. The use rate of the forage above 350 pounds per acre shall be five percent in Category I and II habitat.
2. Turnout in tortoise habitat shall not occur until production of 230 pounds (air-dry-weight) per acre of ephemeral forage is available. The lessee shall be required to remove the sheep from the area or the entire allotment if production falls below 230 pounds per acre. The use rate of the forage above the minimum shall be ten percent.
3. No grazing is authorized except as approved annually by application. All herders shall have a copy of the current use authorization in their possession and a copy posted at the camp site. When trailing, all herders shall be required to have a copy of the current trailing authorization.
4. In tortoise habitat sheep bands shall be limited to 1,000 adult sheep with an approximately equal number of lambs. In all areas total number of sheep shall no exceed 2,000 animals.
5. Sheep shall be grazed in a loose or dispersed pattern.
6. Grazing use shall be limited to one pass per season at a given location. A pass is identified by physical evidence that sheep use has occurred.
7. Bedding and watering sites shall be changed daily, new bedding or watering sites shall be at least one-quarter (1/4) mile from any previous sites. Sheep shall be watered on or adjacent to dirt roads or existing disturbed or open areas cleared of shrubs from past uses.
8. The herder will utilize, when ever possible, previously disturbed sites for all bedding and watering locations. Do not use designated Recreational camping sites as watering or bedding sites.
9. Stopping and parking of vehicles, and vehicular camping along routes of travel would be limited to within 50 feet of all routes in multiple-use class "L" and "M" as described in the California Desert Conservation Area Plan.
10. A camp site or camp trailer shall not remain in the same location for more than seven days. A new camp location shall be at least one mile from any previous camp location. Trash and garbage shall be removed from each camp site; no trash or garbage shall be buried at camp site. All sheep carcasses within 300 feet of a road shall be removed and disposed of in an appropriate manner as soon as discovered and/or livestock operator is notified. Cross-country vehicular travel to gather sheep carcass(es) must have prior approval from the BLM except in designated Open Area for OHV use.
11. All sheep shall be watered on or immediately adjacent to dirt roads (within 25 feet) or in areas that have been cleared of shrubs from past uses.

12. Within 15 days of the close of the authorized grazing period, the permittee/lessee shall submit a map delineating areas of daily grazing use within the allotment.

13. The permittee/lessee will have the authority to ensure compliance with protective stipulations for the desert tortoise, ensure that their employees comply with protective stipulations, and be responsible for coordination with the Bureau, the Service, and California Department of Fish and Game. This includes educating field employees concerning the occurrence of the desert tortoises in the grazing areas and the status of the desert tortoise as a threatened species. Scientific Name

APPENDIX 6

CULTURAL RESOURCES

MAP OF LAST CHANCE CANYON NATIONAL REGISTER DISTRICT (LCCNRD)

SUPPLEMENTAL PROCEDURES FOR LIVESTOCK GRAZING PERMIT/LEASE RENEWALS

A CULTURAL RESOURCES AMENDMENT
TO
THE STATE PROTOCOL AGREEMENT

BETWEEN

CALIFORNIA BUREAU OF LAND MANAGEMENT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

The purpose of this amendment is to address the National Historic Preservation Act (NHPA) Section 106 compliance procedures for processing approximately 400 grazing permit/lease (hereafter “permit”) renewals scheduled for 2004 through 2008. This amendment shall cover grazing permit renewals for livestock as defined in 43 CFR 4100.0-5 as “....domestic livestock – cattle, sheep, horses, burros, and goats.” The following procedures will allow for renewal of the permits while maintaining compliance with the NHPA. Alternative approaches to this amendment may be developed by individual Field Offices, but such approaches shall fall under the Section 106 regulations of the NHPA (36 CFR Part 800) and shall require individual Field Office consultation with the SHPO.

These supplemental procedures are an amendment to the State Protocol dated April 6, 1998, which is scheduled for termination on October 25, 2004. These supplemental procedures will remain in effect when that Protocol is terminated and will become an amendment to a successor Protocol document.

This amendment deviates from the Protocol in *Section VI. Thresholds for SHPO Review*, which states, “*BLM shall complete the inventory, evaluation and assessment of effects and document all findings, including negative inventories and no effect determinations, in BLM files before proceeding with project implementation.*” This amendment would allow for renewal of an existing grazing permit prior to completing all NHPA compliance needs as long as Protocol direction, the BLM 8100 Series Manual guidelines (Protocol Amendment F), and the following specific stipulations are followed:

I. Planning

Grazing permit renewals of any acreage size shall be scheduled for cultural resource compliance coverage over the next ten years. Such long term management includes scheduling for inventory, evaluation, treatment, and monitoring, as appropriate. Schedules for inventories of all renewals to be covered by this amendment shall be delineated by each participating Field Office and submitted to the SHPO and the State Office at the first annual reporting cycle for FY 2004.

This amendment shall only apply to the reissuance of grazing permit authorizations and existing range improvements. All new proposed undertakings for range improvements shall follow the

established procedures within the Protocol or 36 CFR 800, the implementing regulations for Section 106 of NHPA.

II. Inventory Methodology

To address the impacts of grazing on cultural resources, a Class II sampling or reconnaissance survey strategy shall be devised by the cultural resource specialist in consultation with range staff which focuses inventory efforts on areas where livestock are likely to concentrate within areas of high sensitivity for cultural resource site locations. Congregation areas where it has been shown that the greatest levels of impact are likely to occur are generally around springs, water courses, meadows, and range improvement areas such as troughs and salting areas.

All existing range improvements within areas of high sensitivity for the location of cultural resource sites shall be inventoried. However, due to the fact that cattle trailing occurs along fence lines and the area of impact is limited to a one meter wide swath and impacts to cultural resources are generally restricted to this corridor, existing linear improvements will not be inventoried except in areas of high sensitivity for the location of cultural resource sites.

Salting areas may change from season to season making locating these areas problematic. Salting locations will be assessed by the cultural resource specialist in consultation with range staff and the permittee. The permittee will be asked to provide a map designating salting areas and these locations will be inventoried if they occur in areas where the probability for the occurrence of cultural resources is high. All livestock loading and unloading areas and corral areas will also be inventoried within areas of high sensitivity for the location of cultural resources.

A Class I records search will also be conducted for each allotment to ascertain previously recorded site locations and areas of prior survey coverage which can be accepted as meeting current standards. Sites located within livestock congregation areas will be visited to evaluate grazing impacts.

All areas identified for inventory in the survey strategy shall be covered intensely. All unrecorded site locations will be recorded and a report of findings for each allotment will be completed. These investigations shall only address public lands administered by BLM. Private, state and county in-holdings will not be evaluated.

III. Tribal and Interested Party Consultation

Field Offices will be responsible for contacting and consulting with Tribes and interested parties as outlined in 36 CFR 800 and the 8120 manual guidelines. This will also meet BLM government-to-government responsibilities for consultation.

IV. Evaluation

Determinations of eligibility to the National Register of Historic Places shall only be undertaken on sites or properties where it can be reasonably ascertained or it is ambiguous that range activities will continue to impact sites and further consultation with SHPO could be required.

V. Effect

A. Range undertakings where historic properties are not affected may be implemented under the Protocol without prior consultation with SHPO. These undertakings shall be documented in the Protocol Annual Report.

B. Range undertakings where historic properties are identified within APEs, and where historic values are likely to be affected or diminished by project activities, require consultation with SHPO, and ACHP if necessary, on a case-by-case basis, pursuant to 36 CFR 800.5-6.

VI. Treatment

Standard Protective Measures can include but are not limited to:

A. Fencing or enclosure of livestock from the cultural resource sufficient to ensure long-term protection, according to the following specifications:

1. the area within the enclosure must be inventoried to locate and record all cultural resources; and
2. the enclosure (i.e.) fence must not divide a cultural resource so that a portion is outside of the fence; and
3. the cultural resource specialist will determine the appropriate buffer to be provided between the cultural resource and its enclosing fence.

B. Relocation of livestock management facilities / improvements at a distance from cultural resources sufficient to ensure their protection from concentrated grazing use.

C. Removal of natural attractants of livestock to a cultural resource when such removal, in the judgment of the cultural resource specialist, will create no disturbance to the cultural resource (e.g. removing vegetation that is providing shade).

D. Removal of the area(s) containing cultural resources from the allotment.

E. Livestock herding away from cultural resource sites.

F. Use salting and/or dust bags or dippers placement as a tool to move concentrations of cattle away from cultural sites.

G. Locating sheep bedding grounds away from known cultural resource sites.

H. Other protective measures established in consultation with and accepted by SHPO.

The Standard Protective Measures defined above may be used to halt or minimize on-going damage to cultural resources. If the standard protection measures can be effectively applied, then no evaluation or further consultation with SHPO on effects will be necessary. The adopted Standard Protective Measures shall be added to grazing permit "Terms and

Conditions” as appropriate for each grazing permit issued or reissued as fully processed permits (completed NEPA analysis, consultation, and decision). The “Terms and Conditions” for each permit may be modified by the addition, deletion, or revision of Standard Protective Measures as described in Section VII of these Supplemental Procedures.

VII. Monitoring

A. Field Offices shall adopt the following monitoring guidelines:

1. monitoring shall be conducted yearly and documented to ensure that prescribed treatment measures are effective; and
2. when damaging effects to cultural resources from grazing activities are ambiguous or indeterminate, Field Offices shall conduct monitoring, as necessary, to determine if degrading effects are resulting from grazing activities and if they are continuing to affect the characteristics that may make properties eligible to the NRHP or if they are otherwise adversely affecting the values of cultural resources.

B. When monitoring has yielded sufficient data to make effect determinations, the following apply:

1. When no additional degrading damage will likely occur because standard treatment measures are adequate to prevent further damage from rangeland management activities, SHPO consultation on a case-by-case basis is unnecessary.
2. When no additional degrading damage will likely occur, even without implementation of standard treatment measures, then no further treatment consideration of those resources is necessary, even if past grazing impacts to the ground surface are evident.
3. When additional degrading damage will likely occur, mitigation of adverse effects shall be addressed on a case-by-case basis, pursuant to 36 CFR 800.5-6.

When monitoring results or case-by-case consultation result in a determination concerning addition or deletion of Special Treatment Measure(s) for a specific allotment, then that Measure(s) will be added to, or deleted from, the Terms and Conditions of the fully processed permit for that allotment.

VIII. Disagreements

When a Field Office Cultural Heritage staff and Field Office Manager fail to agree on inventory, evaluation, monitoring, and application of Special Treatment Measures, then the Field Office Manager shall initiate consultation with the SHPO.

IX. Reporting and Amending

A. Each participating Field Office shall report annually to the SHPO and the State Office, a summary of activities carried out under this amendment to the Protocol during the previous fiscal year. The reporting shall be included in the Protocol Annual Report.

B. Annual reports shall summarize activities carried out under this amendment. These reports are not meant to be compilations of the individual project reports prepared for the range projects; they are meant to be programmatic summaries of data and significant findings.

C. Annual reporting shall include at least three major sections:

1. schedules and status of accomplishments in meeting schedules for cultural resource activities in relation to the range management program as identified in Stipulation I; and
2. results, as annual summaries of accomplishment and significant findings resulting from rangeland management cultural resource activities; and
3. appendices to the report that would include project, coverage and cultural resource location maps and tabular summaries of total number of cultural resources located, new cultural resources located, cultural resources evaluated, types of treatment measures employed at each location, and cultural resources monitored.

D. Annual reports may contain recommendations for new or revised treatment measures.

E. Either party to this agreement may initiate a process to negotiate new or revised treatment measures or to revise the schedule of inventories. When such a process is initiated, the parties to this agreement shall negotiate new or revised treatment measures or schedule of inventories and such revisions or additions shall be issued as Attachments to these Supplemental Procedures.

STATE DIRECTOR, BUREAU OF LAND MANAGEMENT, CALIFORNIA

/s/ james wesley abbott for

By Mike Pool

Date: 8/17/04

STATE HISTORIC PRESERVATION OFFICER, CALIFORNIA

/s/ milford wayne donaldson

By Milford Wayne Donaldson

Date: 8/18/2004

APPENDIX 7

Required elements for studying grazing impacts in the
Last Chance Canyon National Register District

APPENDIX 7:

Required elements for studying the impacts of grazing in the Last Chance Canyon National Register District.

Data base – existing cultural resources information on the National Register district consists almost entirely of archaeological data. This data is contained in the original National Register nomination package (1971), field notes taken in the 1960s and 1970s by the individual who prepared the nomination form, locational data on BLM cultural resources maps of resources that have been noted over the years but never formally recorded, and site records available in the BLM cultural resources data base and the State of California Cultural and Historic Resources Information System (CHRIS). This disparate data conglomeration will be assembled, field checked as necessary, and entered into an electronic GIS data base compatible with CHRIS. Because inventory and monitoring will be designed to study effects of grazing on various types of resources in various soil types, landforms, vegetation communities, topographical situations, etc., available data on these elements will also be entered into the GIS data base. Some of this data may already be available in the existing BLM data base. This will allow for more accurate, more rapid, and more meaningful design of the monitoring and inventory elements.

Monitoring – Monitoring will consist of setting up study plots in areas in which sheep will graze and monitoring the effects of sheep grazing on resources within those study plots. Monitoring will be designed to answer questions such as: Are some cultural resources more susceptible to impacts from sheep grazing than others? Are impacts more severe or more likely to occur to resources located within or on certain soil types, landform types, or vegetation communities? What kinds of impacts occur to cultural resources from sheep grazing? Study plots will be established to sample various site types, soil types, landforms, vegetation types, and other variables that may condition how sheep grazing affects sites. Plots will be mapped using GPS and a permanent datum will be established at each plot. Prior to sheep grazing, detailed records will be made of the cultural resources within each plot, their condition, size, location, etc. All cultural resources information observable on the surface will be noted. Photographs will document appearance, location, condition, etc. Detailed notes and measurements will be taken. Archaeological monitors should be on site as the sheep graze the area. Numbers of sheep in each band will be noted. After the sheep have grazed through the same analysis that was done before grazing will be repeated to note whether or not cultural constituents have been moved, modified, altered, have disappeared, or if other impacts have occurred. Depth of impact will also be measured. Other information may also be collected. Photographs will be taken after grazing as well. Results will be compiled for use in determining whether or not alterations in grazing should be made. Monitoring will take place for at least 2 grazing years.

Inventory – A systematic inventory for cultural resources will be carried out to sample the entire National Register district. The inventory will be designed to sample all soil types, landforms, vegetation types, and other environmental factors that may influence placement of cultural resources. All natural water sources within grazed areas will be inventoried for cultural resources. The sample will be large enough to define characteristics that affect resource distribution and densities. It can also be used to test the results of the monitoring effort by noting levels and types of impacts to cultural resources in varying circumstances and comparing those results with data collected in the monitoring plots.

Details of monitoring and inventory will be provided in a research design prepared prior to taking either action. Native Americans will be invited to participate in all phases to ensure that areas or resources of concern to them for sacred values are included or not included within monitoring and inventory areas as they think appropriate.

REFERENCES

References for Social & Economic

BLM, Data for Table compiled from case files of individual sheep operators

References for Air Quality, Invasive Species, Soils, Water Quality, & Vegetation

ARB. 1991. Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM₁₀), Visibility Reducing Particulates, Lead, and Hydrogen Sulfide. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 1992. California's Air Pollution Control and Air Quality Management Districts. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 1993a. California Air Pollution Control Laws. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 1993b. Area Designations for State and National Ambient Air Quality Standards. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 1996. Proposed Amendments to Area Designations for State Ambient Air Quality Standards, Including Amendments Due to Changes in Air Basin Boundaries, and Proposed Maps of Area Designations for the State and National Ambient Air Quality Standards. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2000. Recommended Area Designations for the Eight-Hour Ozone Standard. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2001a. California's State Implementation Plan. At <http://www.arb.ca.gov/sip/siprev1.htm>. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2001b. Fine Particulate Matter-PM_{2.5} Particulate Pollution-Charting a Course for Clean Air. At <http://www.arb.ca.gov/pm25/pm25.htm>. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2003a. Air Pollution- Particulate Matter Brochure. At <http://www.arb.ca.gov/html/brochure/pm10.htm>. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2003b. Final Regulation Order for the Rulemaking To Consider Amendments to Regulations for the State Ambient Air Quality Standards for Suspended Particulate Matter and Sulfates. California Environmental Protection Agency, Air Resources Board. Sacramento, CA

ARB. 2003d. Air Quality Emissions and Modeling. At [Http://www.arb.ca.gov/html/aeq&m.htm](http://www.arb.ca.gov/html/aeq&m.htm). California Environmental Protection Agency, Air Resources Board Sacramento, CA

ARB. 2003e. California Air Quality Data. At <http://www.arb.ca.gov/aqd/aqdpagealt.htm>. California Environmental Protection Agency, Air Resources Board Sacramento, CA

Calkins, David L. 1994. Personal communications. USEPA. San Francisco, CA

DeSalvio, Alan. 2003a. Personal communication. Mojave Desert Air Quality Management District. Victorville, CA

Federal Interagency Stream Restoration Working Group. 1998. Stream Corridor Restoration, Principals, Processes and Practices. The Federal Interagency Stream Restoration Working Group. USA

GBUAPCD, KCAPCD and MDAQMD. 1991. Final PM10 State Implementation Plan For The Searles Valley Planning Area. Great Basin Unified Air Pollution Control District, Kern County Air Pollution Control District and Mojave Desert Air Quality Management District. Bishop, Bakersfield and Victorville, CA

GBUAPCD. 2003. 2003 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan. Great Basin Unified Air Pollution Control District. Bishop, CA

Hickman, James C. et al. 1993. The Jepson Manual, Higher Plants of California. University of California Press, Berkeley, CA

KCAPCD. 1993. Rule 402 Fugitive Dust. Kern County Air Pollution Control District. Bakersfield CA

KCAPCD. 1994-2004. Desert Breeze (monthly newsletter). Kern County Air Pollution Control District. Bakersfield CA

MDAQMD. 1993. Amendment Searles Valley Planning Area PM10 State Implementation Plan. Mojave Desert Air Quality Management District. Victorville, CA

MDAQMD. 1994. Rule 403.1 Respirable Particulate Matter (PM10). Mojave Desert Air Quality Management District. Victorville, CA

MDAQMD. 1995. Final Mojave Desert Planning Area PM10 Plan. Mojave Desert Air Quality Management District. Victorville, CA.

MDAQMD. 1996. Rule 403.2 Fugitive Dust Control for the Mojave Desert Planning Area. Mojave Desert Air Quality Management District. Victorville, CA

MDAQMD. 1997. Emission Inventory Guidance. Mojave Desert Air Quality Management District. Victorville, CA

MDAQMD. 2003. Draft Amended Rule 403.2 Fugitive Dust Control for the Mojave Desert. Mojave Desert Air Quality Management District. Victorville, CA

Ono, Duane. 2000. Personal communications, Great Basin Air Pollution Control District. Bishop, CA

Paxton, Thomas. 1993. Personal communications. Kern County APCD. Bakersfield, CA

RWQCB. 1994. Water Quality Control Plan for the Lahontan Region. California Regional Water Quality Control Board, Lahontan Region. South Lake Tahoe and Victorville, CA

Sawyer, John O. and Todd Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society. Sacramento, CA

SCAQMD, 1993a. Rule 403 Implementation Handbook. South Coast Air Quality Management District. Diamond Bar, CA

SCAQMD, 1993b. CEQA Air Quality Handbook. South Coast Air Quality Management District. Diamond Bar, CA

SWRCB, 1998. California Unified Watershed Assessment. California State Water Resource Control Board. Sacramento, CA

SWRCB, 2004. California Nonpoint Source Encyclopedia. California State Water Resource Control Board. At HYPERLINK "<http://www.swrcb.ca.gov/nps/encyclopedia.html>/" www.swrcb.ca.gov/nps/encyclopedia.html/. Sacramento, CA

U.S. Bureau of Land Management. 1980a. Draft California Desert Conservation Area Plan and EIS. Riverside, CA

U.S. Bureau of Land Management. 1980b. California Desert Conservation Area Plan. Riverside, CA

U.S. Bureau of Land Management. 1980c. California Desert Conservation Area Plan Appendix XIII: Livestock Grazing., Riverside, CA

U.S. Bureau of Land Management. 1999. Air Quality Conformity Analysis and Determination Process. Course Number 7000-06. NTC, Phoenix, AZ

U.S. Bureau of Land Management. 2001. Air Quality Conformity for Managers – Satellite Broadcast Course Number 7000-06BC. At HYPERLINK "<http://www.blm.gov/nstc/air/index.html>" <http://www.blm.gov/nstc/air/index.html>. National Science & Technology Center, Denver, CO

U.S. Bureau of Land Management. 1984. Walker Pass Common Allotment Management Plan. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 1989. Sand Canyon ACEC Management Plan. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 1990. Short Canyon ACEC Management Plan. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004a. Draft Air Quality Handbook. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004b. Draft Rangeland Health Determination, Walker Pass Common Allotment, Alexander Use Area. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004c. Draft Rangeland Health Determination, Walker Pass Common Allotment, Sprague Use Area. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004d. Draft Rangeland Health Determination, Walker Pass Common Allotment, Smith Use Area. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004e. Grazing Case Files. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

U.S. Bureau of Land Management. 2004f. Range Improvement Case Files. California Desert District, Ridgecrest Field Office, Ridgecrest, CA

USEPA. 1982. Grazing Nonpoint Source Control Strategy. Environmental Protection Agency, Region VIII, Denver, CO

USEPA. 1993. Federal Register Notice #5863213. Vol. 58, Number 228, P63213-63259. November 30, 1993. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>" <http://www.epa.gov/oar/oaqps/greenbk/5863213.html> . Washington D.C.

USEPA. 1997. PM-2.5 Composition and Sources. Prepared for FACA National and Regional Strategies Workgroup. Office of Air Quality Planning and Standards. At HYPERLINK "<http://www.epa.gov/ttn/oarpg/naaqsfm/>" <http://www.epa.gov/ttn/oarpg/naaqsfm/> . Washington, DC

USEPA. 1999. Handbook for Criteria Pollutant Inventory Development, A beginner's Guide for Point and Area Sources. At <http://epa.gov/ttn/chief>. Washington, DC

USEPA. 2001. Federal Register Notice #6631873. Vol. 66, Number 114, P31873-31878. June 13, 2001. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>" <http://www.epa.gov/oar/oaqps/greenbk/6631873.html> . Washington D.C.

USEPA. 2002a. Federal Register Notice #6750805. Vol. 67, Number 151, P50805-50808. August 6, 2002. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>" <http://www.epa.gov/oar/oaqps/greenbk/6750805.html> . Washington D.C.

USEPA. 2002b. Federal Register Notice #6759005. Vol. 67, Number 182, P59005-59006. September 19, 2002. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>" <http://www.epa.gov/oar/oaqps/greenbk/6759005.html> . Washington D.C.

USEPA. 2003a. Federal Register Notice #6824368. Vol. 68, Number 88, P24368-24370. May 7, 2003. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>" <http://www.epa.gov/oar/oaqps/greenbk/6824368.html> . Washington D.C.

USEPA. 2003c. Federal Register Notice #6837090. Vol. 68, Number 120, P37090-37091. June 23, 2003. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>"
<http://www.epa.gov/oar/oaqps/greenbk/6837090.html> . Washington D.C.

USEPA. 2003d. Compilation of Air Pollution Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources. At <http://epa.gov/ttn/chief/ap42/index.html> Washington, DC

USEPA. 2003e. Federal Register Notices Related to Particulate Matter Designations and Classifications. August 27, 2003. At HYPERLINK "<http://www.epa.gov/oar/oaqps/greenbk/6759005.html>"
<http://www.epa.gov/oar/oaqps/greenbk/pfrnrpt.html> . Washington D.C.

USEPA. 2003f. EPA's Decision on New Air Quality Standards. Office of Air & Radiation. At HYPERLINK "<http://www.epa.gov/ttn/oarpg/naaqsfm/>"
<http://www.epa.gov/ttn/oarpg/naaqsfm/> . Washington, DC

USEPA. 2003g. PM-2.5 NAAQS Implementation. At HYPERLINK "http://www.epa.gov/ttnnaaqsp/pm/pm25_index.html"
http://www.epa.gov/ttnnaaqsp/pm/pm25_index.html . Washington, DC

USEPA. 2003h. Designations for the Fine Particle National Ambient Air Quality Standards. Office of Air and Radiation. Memorandum from Jeffrey R. Holmstead, Assistant Administrator to Regional Administrators, Regions I-X. Washington, DC

USEPA. 2004a. National Management Measures to Control Nonpoint Source Pollution from Agriculture. At HYPERLINK "<http://www.epa.gov/ttn/oarpg/naaqsfm/>"
<http://www.epa.gov/owow/nps/agmm/index.html> . Washington, DC

USEPA. 2004b. Polluted Runoff (Nonpoint Source Pollution). At HYPERLINK "<http://www.epa.gov/ttn/oarpg/naaqsfm/>" <http://www.epa.gov/nps/MMGI/Chapter2/ch2-2e.html>. Washington, DC

References for Wildlife & Wetlands/Riparian

Berry, Kristin. 2000. Major Scientific Contributions from the Desert Tortoise Research Natural Area: 1973-1999". (Slide Presentation given at DTPC Banquet)

Brooks, M. L. 1992. Ecological Impact of Human Disturbance on the Desert Tortoise Natural Area, Kern County, California. Thesis for Master of Arts in Biology, California State University, Fresno. 51pp

Brown, M. B., K. H. Berry, I. M. Schumacher, K. A. Nagy, M. M. Christopher, and P. A. Klein. 1999. Seroepidemiology of Upper Respiratory Tract Disease in the Desert Tortoise in the Western Mojave Desert of California

Chambers Group. 2001. First Year Line Distance Sampling Effort for Desert Tortoise Superior-Cronese and Fremont- Kramer Critical Habitat Units. U. S. Army National Training Center, Fort Irwin

- Hershler, R. 1989. Springsnails (Gastropoda: Hydrobiidae) of Owens and Amargosa River (Exclusive of Ash Meadows) drainages, Death Valley System, California- Nevada. *Proc Biol. Soc., Wash.* 102(1), 1989, pp 176- 248.
- Hershler, R. and D. Sada. 2002. Biogeography of Great Basin aquatic snails of the genus *Pyrgulopsis*. In *Great Basin Aquatic Systems History*, Smithsonian Contributions to the Earth Sciences, Number 33. Smithsonian Institution Press, Washington D. C. pp 255-276.
- Keith, K., K. Berry and J. Weigand. 2005. Surveys for Desert Tortoises in the Jawbone-Butterbrecht Area of Critical Environmental Concern, Eastern kern County, California. Final Report. BLM Office, Ridgecrest, CA
- Laabs, M. A., M. Alaback, and L. F. LaPre. 1990. Sand Canyon Vertebrate Inventory, Final Report, December, 1990. BLM Office, Ridgecrest, CA
- Leitner, P. and B. Leitner. 1996. A comparison of the diets of the Mohave ground squirrel and cattle: Results of a long-term study in the Coso Region of Inyo County. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA
- Leitner, P. and B. M. Leitner. 1998. Coso Grazing Exclosure Monitoring Study- Mohave Ground Squirrel Study, Coso Known Geothermal Resource Area, Major Findings. 1988-1996. 42pp +Appendix
- Rodríguez-Robles, J.A.; Stewart, G.R.; Papenfuss, T.J. 2001. Mitochondrial DNA-based phylogeography of North American rubber boas, *Charina bottae* (Serpentes: Boidae). *Molecular Phylogenetics and Evolution* 18(2): 227-237.
- Schneider, J. S. and G. D. Everson. 1989. The desert tortoise (*Xerobates agassizii*) in the prehistory of the Southwestern Great Basin and adjacent areas. *Journal of California and Great Basin Anthropology*. Vol.11, No.2, pp. 175-202 (1989)
- Stebbins, R. C. 2003. A field guide to western reptiles and amphibians, 3rd edition. Houghton Mifflin Company. Boston, New York, 533pp
- Tracy, C. R., R. Averill- Murray, W. Boarman, D. Delahanty, J. Heaton, E. McCoy, D. Morafka, K. Nussear, B. Haggerty, P. Medica. 2004. Desert Tortoise Recovery Plan Assessment (Working Draft, March 15, 2004). 146 pp
- U.S. Bureau of Land Management. 2003. Draft Environmental Impact Report and Statement for the West Mojave Plan. Pp + Appendices
- U.S. Bureau of Land Management. 2004. FY 2005 Ridgecrest Field Office O&M Grant Application. 87 pp
- U.S. Fish and Wildlife Service. 1994. Desert Tortoise (Mojave Population) Recovery Plan, Portland, Oregon., USFWS Rept., 73pp + Appendices.
- USFWS. 1994. Desert Tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon, 73 pp. (+ Appendices).

References for Cultural Resources & Native American Concerns

ASPPN

- 1990 Impacts of Domestic Livestock Grazing on Archaeological Resources. Archaeological Sites Protection and Preservation Notebook, Technical Notes I-15. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- Bevill, Russell, Michael S. Kelly, and Elena Nilsson
- 2003 Archaeological Inventory of the First and Second Los Angeles Aqueducts and Selected Access Roads, Kern, Inyo, and Los Angeles Counties, California (Draft). Prepared for BLM and LADWP. On file, BLM, Ridgecrest Field Office.
- Bevill, Russell and Elena Nilsson
- 2004 Archaeological Inventory within the Jawbone Area of Critical Environmental Concern (ACEC), Kern County, California. On file, BLM, Ridgecrest.
- Fowler, Catherine S., Molly Dufort and Mary K. Rusco
- 1995 *Timbisha Shoshone Tribe's Land Acquisition Program: Anthropological Data on Twelve Study Areas*. Report submitted to the Timbisha Shoshone Tribe, Death Valley, California. Funded by Administration for Native Americans.
- Grosscup, Gordon L.
- 1977 Notes on Boundaries and Culture of the Panamint Shoshone and Owens Valley Paiute. *Contributions of the University of California Archaeological Research Facility* 35:109-150.
- Kroeber, A. L.
- 1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Government Printing Office, Washington, D.C. Reprinted 1976 by Dover Publications, Inc., New York, N.Y.
- Nielson, Axel E.
- 1991 Trampling the Archaeological Record: An Experimental Study. *American Antiquity* 56(3):483-503.
- Norwood, Richard H., Charles S. Bull, and Ronald Quinn
- 1980 *A Cultural Resource Overview of the Eureka, Saline, Panamint and Darwin Region, East Central California*. BLM California Desert District Publications in Cultural Resources, Eric W. Ritter, General Editor. Riverside, CA.
- Osborn, A. Vetter, R. Hartley, L. Walsh, and J. Brown
- 1987 Impacts of Domestic Livestock Grazing on the Archeological Resources of Capital Reef National Park, Utah. *National Park Service Midwest Archeological Center, Occasional Studies in Anthropology*, No. 20. Lincoln, NE.
- Roney, John
- 1977 Livestock and Lithics: The Effects of Trampling. Department of Interior, Bureau of Land Management, Winnemucca District, Winnemucca, NV.
- Steward, Julian H.
- 1938 *Basin-Plateau Aboriginal Sociopolitical Groups*. Bureau of American Ethnology Bulletin 120. United States Government Printing Office, Washington, D.C. Reprinted 1970 by University of Utah Press, Salt Lake City, Utah.
- Thomas, David Hurst, Lorann S. A. Pendleton, and Stephen C. Cappannari
- 1986 Western Shoshone. In *Handbook of North American Indians, Vol. 11: Great Basin*. Warren L. D'azevedo, Vol Editor. Smithsonian Institution, Washington, D.C.
- USDI, BLM

- 1982a A Sikes Act Management Plan for the Jawbone – Butterbrecht Area of Critical Concern (CA-06-ACEC- 20) and the Sierra – Mojave – Tehachapi Ecotone Wildlife Habitat Management Area (CA-06WHA-20). On file, Ridgecrest Field Office, Ridgecrest, CA.
 - 1982b Last Chance Canyon Area of Critical Environmental Concern (ACEC) Management Plan and Environmental Assessment. On file, BLM Ridgecrest Field Office.
 - 1987 Management Plan for the Bedrock Spring Area of Critical Environmental Concern (CA-060-ACEC-24). On file, BLM Ridgecrest Field Office.
 - 1988 Management Plan for the Christmas Canyon Area of Critical Environmental Concern (CA-06-ACEC-23). On file, BLM Ridgecrest Field Office.
 - 2003 Environmental Assessment Livestock Grazing Authorization, EA Number CA 170-03-54, BLM Bishop Field Office, December 2003. On file, BLM.
- Zigmond, Maurice L.
- 1972 *Kawaiisu Ethnobotany*. University of Utah Press, Salt Lake City, Utah.
 - 1986 Kawaiisu. In: *Handbook of North American Indians, Vol. 11: Great Basin*. Warren L. D'Azevedo, Volume Editor. Smithsonian Institution, Washington, D.C.